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Benefits of interference

The oldest and newest questions about higher education are the same: how much freedom should universities and other colleges be granted from immediate political, economic, and social pressures? It is this question in some form that underlies all the detailed issues with which we are forced to be familiar - cuts, privatization, standards, tenure, the organization of research, the roles of the University Grants Committee and the National Advisory Body and so on. The views of individuals and institutions on these many issues are determined by their attitude to the antecedent question: should decisions about as well as in higher education be left to the academic guild, or should they be taken by politicians, civil servants, and the others who rule our lives?

The traditional British practice has been to allow higher education, at any rate the universities, an exceptionally large degree of autonomy. That practice may have been substantially qualified by the slow but certain action of a thousand exceptions over the last quarter of a century, but the assumption of autonomy remains very strong. Autonomy is regarded as the natural condition of higher education; any form of external regulation has to be rigorously and exceptionally justified.

This dichotomy between autonomy and control was an important theme of a conference organized by the University of Edinburgh last summer to celebrate its 400th anniversary and now published as a book (*Universities, Society and the Future*, Edinburgh University Press, £11). It was visible in all three sections of the conference: on the early modern university, the liberal ideal in a scientific age, and British higher education and the university system (really a discussion of future prospects dominated by the recently published Leverhulme report). The limits of legitimate, and beneficial, interference were a persistent issue in all three periods: the two centuries to the eighteenth century enlightenment, the industrial revolution, and the future shock of the approaching post-industrial revolution.

Naturally the autonomy/accountability issue was most pronounced in the third section of the conference. Dr Harold Silver, of Bournemouth College of Higher Education, warned of the dangers of post-Robbins isolationism. He insisted that universities would inevitably be drawn into debates about the relationship between their values, processes and structures and the operation of the professions and the

labour market. Far from being uncontested, the traditional values of British higher education, including the overwhelming aspiration for autonomy, appeared rather when viewed across national boundaries and across time.

Dr Silver was really making two points. First, higher education has little choice but to regard itself as accountable because lay society in its many forms has the effective power to make it a series of offers which it cannot refuse. Second and much more interesting, it is from higher education's efforts to adapt to changing external circumstances and meet new needs that universities and colleges create and recreate their internal dynamism not only as social but as intellectual institutions. In other words external regulation is not only inevitable but can be creative.

At the Edinburgh conference Sir Stuart Hampshire of Wadham College, Oxford, took an exactly opposite view. He argued that if higher education paid too much attention to what he called "society round the corner", its creativity would be blunted, its horizons for future action would be restricted and the quality of the experience it offered students impoverished. Unlike Dr Silver he believed that external interference, far from potentially stimulating a creative response in higher education, would inhibit the expression of creativity.

Majority opinion, certainly within universities and probably in polytechnics and colleges, is on the side of Stuart Hampshire rather than of Harold Silver. A "dominant dominance" entrenched in autonomous institutions is an ideal to which most people in higher education, with different degrees of embarrassment, still aspire. They may feel unhappy with the fundamentalist distinction between the practical and academic worlds drawn by Kenneth Minogue 10 years ago in his book *The Concept of a University*, but they still believe that the greatest possible degree of autonomy is the best possible guarantee of intellectual freedom, certainly and arguably of institutional effectiveness also.

But is this conventional, and for the self-interest of higher education comfortable, view correct? Is intellectual creativity stimulated by external influence or does it flourish best by being left in peace? This is a crucial question for the future of higher education. It is also one on which the Edinburgh conference shed unexpected light. For by ranging over four centuries of

university history the conference made it possible to judge the historicity of the beneficial claims of institutional autonomy.

In his paper on social control and intellectual excellence the historian Lawrence Stone argued that the development of universities was mainly the result of external forces; parents, church and state in sixteenth century Oxford, Parliament in nineteenth century Oxford and the city council in sixteenth century and early eighteenth century Edinburgh. The decay of universities on the other hand tended to be mainly the result of internal pressures and contradictions, as in Oxford after 1660 and Edinburgh in the late eighteenth century. Translated into late twentieth century terms, this interpretation could be employed to justify both the *dirigisme* of the UGC and even the growing involvement of the Department of Education and Science in the details of university policy. And to that extent the historical record could be read as justifying Dr Silver's view of the sources of institutional and maybe also intellectual creativity in higher education rather than Sir Stuart Hampshire's.

Of course such a crude exponentialism will not do. Parliament in the 1850s may have been the source of a beneficial reform of Oxford and Cambridge, but it does not follow that the intervention of the aspirant neo-conservative state of the 1980s will be similarly beneficial. Many polytechnic directors will not be easily convinced that the detailed operation of the binary policy is a source of academic creativity (although Edinburgh's regents probably deplored the 1708 intervention by the city council) and many university vice chancellors will find it equally difficult to accept that the interventionist cuts of recent years will stimulate a rise in standards.

But the historical record should make us question our instinctive belief in the absolute advantages of autonomy. Dr Silver's warning of post-Robbins isolationism does seem to be justified, especially in universities where its mischievous illusion can be sustained most easily. But to reject isolationism is not to surrender to the crude utilitarianism which is the sum of the DES's present view of the value of higher education. Indeed the victory of such philistinism is much more likely to follow the collapse of ill-judged attempts to maintain an untenable autonomy than of a mature recognition of the continuous need to adjust the appropriate balance between autonomy and accountability.

I wonder if we might deal with my timetable at this point, Doctor Wernitz. Auslander seems to be getting a little frisky. Certainly, Doctor Rayburn. Your major responsibility will be for *Advanced Socio-Linguistics and Clearing Fallen Concrete Chunks From Around The Outside of the Building*. And as before we'd be only too happy if in the case of larger chunks you felt able to call upon help from Auslander.

Laurie Taylor



("Our crumbling universities". Headline in THE TIMES)

Now, shall we take item Seven - *Timetable for the Spring Term* - before the smoking break? Do we really need a smoking break, Professor Lapping? I thought it had been established that no one in the Department now smoked.

That's correct, Doctor Hakemaster, but we did agree by a narrow majority that the smoking break should be retained because it provided Doctor Rayburn with an opportunity to exercise her German Sheppdog. I'm sorry, I'd forgotten.

That's perfectly all right. Item Seven, then? Yes, Doctor Wernitz, if you'd like to lead us through this one. Of course, sir, I think everything is now pretty straightforward. Mr Odgers, as last term, will take sole responsibility for *Radical Perspectives in Media Studies and Buckets in "A Corridor"*. Professor Teetlebbaum will continue with second year *Semiotics and Sausage and B Block Maps*.

Does that still include *Brooms*, Doctor Wernitz? Yes indeed, Professor Teetlebbaum, but only in the case of *Everyday Soap*. When conditions call for *Advanced Baiting*, then, of course you will have your usual assistance from Doctor Gresham of Abnormal Psychology.

Thank you, Doctor Piercemuller. Is he here at the moment?

Unfortunately not, Doctor Wernitz. Apparently he's rather tied up at home - something about it already being past the twelfth day and the decorations not being down.

I see. Well, perhaps someone could note that his course on *Linguistic Relativism* commences this term, and that his other departmental responsibility will be for *Sudden Gaps in the Floor*.

I wonder if we might deal with my timetable at this point, Doctor Wernitz. Auslander seems to be getting a little frisky. Certainly, Doctor Rayburn. Your major responsibility will be for *Advanced Socio-Linguistics and Clearing Fallen Concrete Chunks From Around The Outside of the Building*. And as before we'd be only too happy if in the case of larger chunks you felt able to call upon help from Auslander.

Thank you, Doctor Wernitz. Finally, I myself will continue with *Transformational Grammar and Precious Blackboards*. Doctor Comstock will handle *Elaborated and Restricted Codes and Trapped Lifts*, and Professor Lapping who is on sabbatical has kindly agreed to carry on with *Postgraduate Hermeneutics and Badly Made Doors*. And one piece of good news. The problem over the lavatories in B Block has now eased and the Bureau will be returning to its usual office thus making the small camping site in Car Park D available for the student council. Any questions?

It seems not, Doctor Wernitz. Then, may I propose we accept this term's timetable?

Woof! Woof! Thank you, Auslander. Time for waffles, everyone.

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DES changes its mind on fall in student numbers

by Ngaio Crequer

The Government is having second thoughts about its gloomy prediction that the number of students will fall by one in five in the remaining years of this century.

The Department of Education and Science has agreed to modify its projections of future student demand after criticism from vice chancellors, university teachers and the Royal Society who all insist they are too low. A meeting took place last week between officials from the DES, the Committee of Vice Chancellors and Principals and the University Grants Committee, with a view to reaching agreement on the assumptions behind changes in demand.

The DES Report on Education No. 9 predicted a 14-19 per cent fall in numbers for higher education between now and the end of the 1990s. But the CVCP, the Royal Society and the Association of University Teachers, although they have only investigated the university sector, have all predicted that demand will be much higher and that the DES has made wrong assumptions.

The CVCP says that for the universities alone the decline will not be more

than 8 per cent, and in this decade there will be no fall at all.

When the vice chancellors met Sir Keith Joseph, Secretary of State for Education, just before Christmas, the two parties agreed it was a consensus to have such a wide disparity when the same data was being used, and an attempt should be made to find common ground.

A DES spokesman said this week: "There have been consultations with the CVCP on the assumptions which underlie this statistical compilation. These will continue over the next two or three months with a view to getting revised projections by about Easter."

The question of the distribution of students between the university and public sector will be discussed next week when the UGC has a two-day meeting with the CVCP. Professor Keith Clayton, of the UGC, and Professor Randolph Quirk, vice-chancellor of London, will deliver papers.

Other issues to be discussed are finance, research and organization. The UGC has now told universities how much their recurrent grant will be reduced for the 1983/84 academic year because of the new cuts imposed last July.

Hull University has been docked £112,000. This and the prospect of new cuts has caused Hull to withdraw its offer to admit 75 extra vocational and technological students over the next two years.

Kent University also said this week it was re-assessing its decision to offer to take additional students. Leeds and the University of Wales Institute of Science and Technology have already withdrawn their offers.

The UGC has told the universities that because money from the redundancy compensation fund was used to absorb the July cuts, the cost of compensation still had to be met, and this would have to come out of the recurrent grant for 1983/84 and 1984/85.

The UGC does not yet know how many staff will retire early but it is expecting a last minute rush in March, when the special scheme expires. They have said they will honour all eligible claims, but the universities will now foot some of the cost.

The UGC said this week that at the last count in October, £91m had been spent on compensation for 4,700 staff. They expect the final bill to be between £130m and £140m.

Hotel shaken but not stirred

Polytechnic students took over a top Brighton hotel this week, enunciated themselves in kitchens, bedrooms and bar, but the hotel staff away in an upstairs room... and nobody minded at all.

Guests at the Old Ship Hotel appeared hardly to notice when staff serving them - like John Lee in the bar here - looked more youthful, and more nervous, than usual. No one told them, unless they asked, that all those in black and white uniforms - instead of the customary brown - were in fact second year students on Brighton Polytechnic's hotel and catering management course making a fortnight's foray into the real world of 7am starts and dinner for 250.

In their first week at the Old Ship - £37.50 a night, the oldest hotel in Brighton - the 54 students were each attached to a member of staff and did their job under strict supervision. But at the beginning of this week, when the Monday morning shift arrived, the students found no names on the hotel duty boards and almost no one to do the work apart from themselves.

All the real staff were at their annual staff training seminar - where they stayed for two days, with only occasional checks to see if the students were coping. According to the hotel general manager they copied very well, even reminding his own staff of niceties they sometimes forgot.

"The haven't really worked at a hard pace though", he said, a comment that would not have been appreciated by the students, who were blowing up balloons and polishing cutlery for the 250 staff and directors' annual dinner dance.

NELP faces up to compulsory job losses

by Karen Gold and David Jobbins

Steps to declare up to 200 academics redundant to add pressure for volunteers to leave by the end of March were being recommended this week by Mr Gerry Fowler, the director of North East London Polytechnic.

Papers outlining the severe financial problems facing the polytechnic as a result of the reduced pool allocation and squeeze on local government spending were presented this week by Mr Fowler. They show the extent to which the polytechnic will have to rely on compulsory job losses to achieve the savings needed to match spending to income. Staff are being offered voluntary redundancy with their salary to August 31, Mr Fowler says. If the voluntary

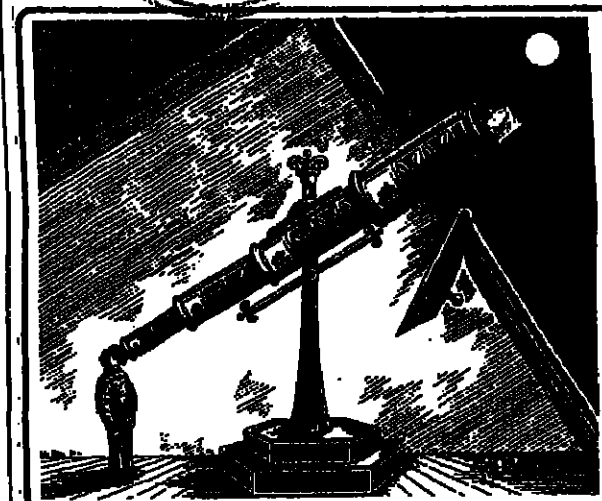
made by the earliest possible leaving date. This means voluntary redundancy, but indications are that the scope is limited because the NELP's teaching staff has already been reduced by 200 by similar means over the past two years.

There is likely to be increasing pressure on members of staff in promoted and senior grades to leave because of the large savings. The NELP has consistently topped the list of reduced pool allocation and squeeze on local government spending. Papers outlining the severe financial problems facing the polytechnic as a result of the reduced pool allocation and squeeze on local government spending were presented this week by Mr Fowler. They show the extent to which the polytechnic will have to rely on compulsory job losses to achieve the savings needed to match spending to income. Staff are being offered voluntary redundancy with their salary to August 31, Mr Fowler says. If the voluntary

strategy is successful the loss of jobs can be contained to up to 125. "I cannot think it probable or even likely that this number of terminations can be achieved by voluntary means," he said.

Mr Fowler's paper also contained a "guide" to the approximate job losses required from each of the NELP's departments by March 1985 (about 115 in total) and by the following year in order to achieve recommended National Advisory Body/student ratios. That total loss is 220.

There are wide fluctuations between departments. Computing is the only area to receive increased staff. Most areas of engineering are hard hit; but management loses the most. Since the figure of 115 is only just over half the total job losses required, Mr Fowler told the polytechnic gov-



It's all in the stars, 19

Graduates' prospects improve

by Felicity Jones

Improved career prospects are predicted for graduates this year but there is evidence that employers are discriminating in favour of certain universities and polytechnics. This is shown in the annual forecast of graduate supply and demand compiled by the Standing Conference of Employers of Graduates.

The fact that more employers are booking recruiting visits plus a 12 per cent rise in job vacancies reported at some universities gave grounds for "cautious optimism" said the SCOE survey, compiled with the Association of Graduate Careers Advisory Services and the Central Services Unit for Careers and Appointments Services. The optimism however was immediately challenged by the National Union of Students.

President Mr Neil Stewart pointed out that one in five of last year's graduates was still looking for a job at Christmas. He said: "This means a bleak, depressing start to 1984 for many graduates after years of poverty at college working for their degrees."

The prediction of better prospects was based on the experience of universities like Manchester. Its careers service showed a 12.3 per cent increase in employers' vacancies over last year and current vacancy lists were running 14 per cent higher. Nationally it was more like 5 per cent.

Mr Brian Pitt, CSU director said that reports from institutions in London and Cambridge matched this level of growth but there would be parts of the country where this was not the case. He was aware that there had been cases where employers had favoured particular institutions "so as to cut down the pressure of applicants" and this was a "disturbing trend". Some employers had also withdrawn

continued on page 3

Pharmacy shortfalls revealed

A confidential University Grants Committee report on pharmacy has revealed that four university departments are below the minimum intake, although only one, Heriot-Watt was told to close for precisely this reason.

The report by the panel on studies allied to medicine also ranks 11 pharmacy departments visited. It says the London School of Pharmacy, Strathclyde and Manchester "are the strongest academically, having good leadership and strength and depth in teaching. Research at each is active and of high quality."

The courses at Aston, Bath, Bradford and the University of Wales Institute of Science and Technology "are not of quite the same level of academic attainment... they provide a flow of well-trained pharmacists for the profession and each has some research activities of quality."

Chelsea College "is a good school which could take more students than its present intake (52)". (The UGC regards 60 as the minimum.)

Nottingham reduced its intake more than the UGC intended "and is well below the recommended minimum intake level." But it has new buildings which should be more fully exploited, and there is a medical school.

Queen's University, Belfast "notwithstanding its weakness in terms of numbers should continue... at its planned future annual intake of 35 home students," because it is the only school in Northern Ireland.

The Heriot-Watt department "is the weakest of the university schools on the mainland in terms of academic attainment, and its research remains modest." Its intake of 35 is well below the desirable level. If the university moved to Riccarton, new buildings would cost £800,000. The panel recommended closure.

The panel is chaired by Professor C. T. Doherty of the Royal Postgraduate Medical School, Hammersmith Hospital. Members are Professor P. H. Elworthy, pharmacy department, Manchester University; Dr F. Fish, the London School of Pharmacy; Professor J. B. Stenlake, pharmacy department, Strathclyde University; Dr F. W. Campbell, physiology department, Cambridge; Professor R. J. Linden, physiology department, Leeds University; and Professor M. S. Losowsky, department of medicine, Leeds University.

The report was sent to vice chancellors of the 18 institutions by Mr Norman Hardyman, secretary of the UGC, and will be discussed at its February meeting.

Mr John Akker, deputy general secretary of the Association of University Teachers said: "We expect that after the widespread criticism there will be of this report in the universities and pharmaceutical industry, that it will be rejected. The credibility of the UGC is on the line."

Letters to the editor

Reversing the UGC's questions

Sir, - You will be aware that the University Grants Committee recently sent out a circular letter headed "Development of a strategy for higher education into the 1990s". We feel that before universities respond to the UGC they should ask the UGC some questions of their own. We suggest the following questions using the headings thoughtfully provided by the UGC letter.

Resources/student numbers

1. On what basis does the UGC believe that Britain requires a smaller university population when all its main competitors have much larger populations?
2. What economic and social thinking underlies the UGC belief that global restriction in public expenditure will improve the situation in the UK?
3. Will the UGC modify its projection of decline in student numbers in the light of the evidence submitted by the Association of University Teachers?
4. Does the UGC think it is appropriate to solve short-term problems by squandering long-term assets in the public sector?

Balance of subjects

5. In the light of the UGC's stated aim to "see a shift towards technical, scientific and engineering courses and towards other vocationally relevant forms of study", could the UGC explain why technological universities

were among those hardest hit in 1981/82?

6. What criteria, if any, guided the UGC decision on cuts in 1981/82?
7. What specific projections, if any, concerning the development of the British economy, governed the criteria chosen under question six, if such criteria existed? What is the proper relation of higher education to the economy, if such a thing continues to exist?

Research

8. Could the UGC explain how the upward revision in staff-student ratio improves the possibilities of research?
9. Could the UGC explain how greater selectivity of social science research funding might be contrived than the relatively low funding currently in operation?
10. What priorities govern the current distribution of research funding between disciplines?
11. Could the UGC comment on the effects on innovative research of the standstill in regular recruitment to university posts?
12. Would the UGC like to sponsor research into the effects of the Government's educational and social policies? Dependence on public funds
13. Do you think that universities should enjoy in practice the academic autonomy granted by Royal Charter?

Nature of universities

14. Would the UGC like to see the humanities and those social sciences which survive at all confined to Oxbridge and a handful of the larger civic universities?
15. Could the UGC say what benefits, in measurable terms, might accrue from a rigid, centrally administered hierarchy of institutions and courses?
16. Would the UGC not agree that there are positive effects of synergy from the inclusion of a wide range of disciplines of both a scientific and non-scientific kind in the same institution? Does the concept of a university imply an element of universality?
17. In what way does your view of the health of the whole system differ from your view of the health of each institution within it?
18. Does industry know better than universities how to run universities? Would the UGC care to comment on the relative success of British industry and the British university system?
19. Would the UGC publish the criteria governing the allocation of new blood posts?
20. Would a more equitable system of allocating new posts not leave the choice of subject to the universities concerned?
21. What will be the long term consequences of the increasingly un-

balanced age profile of academic staff?

22. Would you rather cut your own throat or somebody else's? (Better leave this question out of the final draft - P.S.D.)
23. By what right does the UGC believe universities should abrogate their statutory legal and moral obligations to academic staff?

Leverhulme proposals

24. Is the UGC sympathetic to the idea of a broader curriculum at sixth form level?
25. If so, how does it square the belief with the desire of the Secretary of State to shift the pattern of study within universities towards technical and scientific subjects?
26. Should the best model for the future of higher education be the University of Buckingham or the London Business School?
27. Does not the UGC believe that the health of the university system would be improved if the UGC worked shorter hours than it does at present?
28. How does the UGC respond to its new role as the central apparatus of the higher education system in imitation of the Soviet model?
29. Who are you trying to kid?

Yours faithfully,
ALAN CARLING
ROGER FELLOWS
University of Bradford.

Part-time study for a degree

Sir, - You reported on January 6, under the heading "Jobless lose out on part-time study", a recent survey by Dr John Banfield of Queen's University of Belfast on the experiences of a selected group of past graduates from Birkbeck College. Your report and headline give a most misleading account of what I understand to be an early draft of the results of the survey and, therefore, of part-time degree study at Birkbeck now.

First, you fail to mention that over half those surveyed had taken master's degrees and therefore had used their time at Birkbeck to improve their career prospects or to bring themselves up-to-date. By definition, all such students must have had first degrees, but this is not true of most of those taking part-time first degrees. It is far from the truth that part-time study is "only suitable . . . for those who have taken part already in further and higher education", although many of our students have demonstrated their commitment by taking GCE O or A level subjects by evening study as a preparation for Birkbeck.

Second, the "jobless", Birkbeck would like to be able to remit fees for the unwaged, but it has been refused funds for this purpose, though these have been given to the Open University. College funds are used to remit fees for many of those who become unemployed after beginning their course. Part-time degree study is eminently suitable for unemployed people, since they can take jobs as soon as they arise; the only obstacle is that they - unlike full-time students with grants - must pay fees.

Third, most of our students, like those in all forms of further and higher education, are certainly middle-class, or at least in "white-collar" jobs. Part-time degree study is certainly not a panacea for a society which has failed to widen recruitment to higher education although it is a valuable route for another under-privileged group, women. But it is unreasonable to conclude that part-time study is only suitable for middle-class students.

Part-time degree study is, as the report concludes, "cheap and effective". Only 4 per cent of those surveyed would not recommend others to do a part-time degree, despite the difficulties, the self-discipline and the high motivation which is required. On the same be said of conventional full-time higher education?

Y. G. OVEREND,
Master,
Birkbeck College, London.

OU expels 400 fourth-time failures

by Bert Lodge

The Open University has expelled more than 400 undergraduates who failed their annual exams for the fourth year running.

Letters went out last month to 433 undergraduates informing them their name had been removed from the student register. They are the first university ones among 65,000 currently studying for a OU degree but their chance of gaining a degree has not gone for ever. They have been told that if they apply again within the next two years they will be considered for readmission.

The university began to consider

excluding students only in 1978 when admission tutors became increasingly aware of a group of students who were signing on year after year without making progress. Mr David Grugeon, pro-vice-chancellor for teaching and students, said this week: "Some of them written to last month had been with us since 1971, the year we opened."

But the actual counting of individual failures began only from 1980. In 1982 all who had failed in 1980 and 1981 were warned by tutor counsellors that if they failed that year and the year following they were likely to lose their places.

At the same time they were offered advice on the scale and nature of their

subsequent studies. "As a result a substantial proportion failed themselves voluntarily," Mr Grugeon said.

Another 193 just passed the course after four years and a further 38 did well enough in the end-of-year exams to be offered the chance of a re-sit. "In 16 cases decision was deferred for very special reasons," Mr Grugeon explained. "They may have been very ill and their doctor informed us they were unlikely to be in the university system much longer."

No particular subject group stands out among those struck off the register. "In most cases they were people who were massively over-committed," Mr Grugeon said. "Perhaps a wife has gone back to work when the children

are still young. Or there may be elderly relatives. Some may have passed the exam three or four years running in earlier times. They just can't get out of the habit of signing on each year." We are helping them to take a genuine break for a while."

Members of staff have felt for some time that the university must be seen to take action against repeated failures if it was to retain its reputation and credibility. Apart from the demoralizing effect on their tutors, such students were occupying places when cuts in public expenditure meant the university was unable to admit other applicants.

TES

Two-year degree proposals face widespread opposition

There is little support for the introduction of two-year degrees in the 130 submissions to the National Advisory Body's consultations on its long-term strategy.

A detailed analysis of the responses has begun now that the December 31 deadline has passed, but NAB officials say it is too early to detect general trends. More submissions are known to be on their way and it may be March before the debate begins in the NAB board.

However, it is clear that there is widespread opposition to the most radical proposal in the paper sent out for consultation: the replacement of some three-year degree by two-year courses. The Church of England, for example, which has published its response, finds merit in greater diversity in course lengths but accuses the NAB of damaging its own case by emphasising the savings possible from such a move.

"It is distressing and disturbing to find a paper which uses the word 'strategy' in its title concentrating so much on issues of finance and economic benefit and declining to pursue the question of social purposes further than a mere acknowledgment of the question's existence," the Church contends. "Educational strategy should

not be restricted to consideration of the material benefits of an effectively education society."

The paper, issued by the General Synod Board of Education, goes on to accuse the Government of expounding "old-fashioned values" but putting a much more mercenary meaning on the word "value" when applying it to the education system. It was an outlook which opened up the danger of two societies growing up with conflicting interests.

The Church challenges the assumption that increasing public expenditure

on higher education is not a live option and it concludes: "Whatever strategy may be adopted it must be adopted because it is educationally and socially defensible, not just because it is cheap."

The Council for Educational Technology accuses the NAB of missing the point of the debate in its consultative paper.

Questions about changing the size of classes and length of the academic year in the NAB's *Towards a strategy for local authority education* start from the wrong premise, since they begin with

Report urges cut in staff

by Jon Turney
Science Correspondent

Large-scale staff reductions are certain at three Science and Engineering Research Council establishments following a report on the future of ground-based astronomy in the council. But the panel which produced the report makes no clear recommendation on the number of sites to be maintained.

The report, from a nine-member panel chaired by Professor Peter Willmore of Birmingham University, raises the possibility of amalgamating the Royal Greenwich Observatory and the Royal Observatory, Edinburgh, at the Edinburgh site. But this is seen as a second best option to maintaining both observatories, together with the Rutherford-Appleton Laboratory's astronomy division, with staff cuts at each one.

The main immediate decisions now rest with a meeting today of the SERC's Astronomy, Space and Radio Board, which will consider the report. The Willmore panel's preferred option sets detailed targets for staff reductions by the end of the 1980s, but leaves the speed with which these targets are approached up to the board.

Despite the choice of first option, the panel's recommendations are a further blow for the Greenwich observatory. Professor Willmore's group were asked to find savings of over £1.5m from the astronomy board's budget for next year, and looked closely at the future of the two observatories. This followed a recommendation from the Government's cost-cutting Rayner unit last year that Herstonmoor, Castle, part of the Royal Greenwich Observatory, be sold, and the SERC look at a possible merger.

Although the panel, known as the "piranha panel" among staff at the establishments, opted for keeping both observatories, they were only marginally in favour of this course. Whatever happens, the board is likely to accept the proposed staff cuts, and endorse the panel's advice that targets must be planned well in advance to maintain a scientifically balanced programme. Many astronomers are anxious that the future of the two observatories be considered over a longer time scale.

The final outcome will also depend on the balance between space and ground-based observation in astronomy, currently under consideration by another group chaired by Professor Mark Richmond, vice-chancellor of Manchester University.

Mr Stewart said that that unwritten deal by which students in the 1960s and 1970s were prepared to put up with poor conditions and low income in return for a well-paid job at the end of their studies was invalidated by the current levels of unemployment.

As part of its "New Deal for Students" campaign launched this week the NUS called for Government action to ensure fair play in recruitment.

Other demands are a £30 a week grant for all college students, more independence from parents, abolition of the student deduction for housing benefit and the dropping of Government plans to change the system of travel awards.

A mass demonstration in London is being planned for March 10.

Leader, back page

Funding myth

Sir, - In his letter regarding relative funding of universities and polytechnics (THESE, January 6) the secretary general of the Committee of Vice-Chancellors and Principals states that "a myth about 'expensive' and 'over-provided' universities has been promulgated". One trusts this is a myth easily dispelled. The universities of the UK are acknowledged to be among the most cost effective in the world.

The Association of Polytechnic Teachers long ago pointed out to both the CVC and the Association of University Teachers the dangers inherent in a binary system in which one sector of higher education was treated so much worse than the other: their support for the polytechnics and similar colleges would have helped to ensure that the universities were saved from the dangers of levelling down.

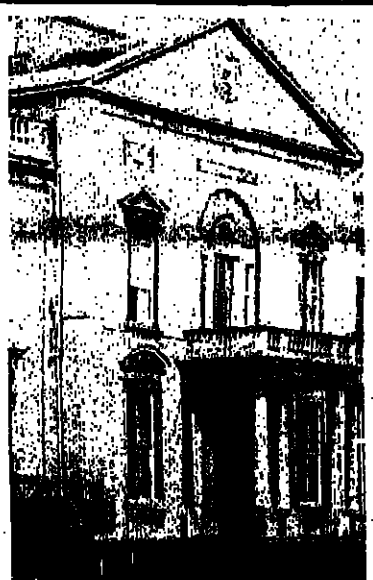
It is not too late.

However, it does not help the case of either the universities or the polytechnics, separately or jointly, for the secretary general of the CVC to say: "The facts speak for themselves" and then to quote figures which, after careful laundering, purport to show that the universities are more funded than the polytechnics. When the facts speak for themselves the story they tell is very different and everybody knows it.

Fair do's?

Sir, - My two local institutions provide contrasting examples of Government treatment of the major policy issues identified in your editorial of December 30. At Buckingham, the "university" has promoted developments in one area - two-year "degrees". The quotation marks are used to denote the degree which it has been rewarded, doubts which it has articulated in an earlier editorial. It has also been rewarded by state funds supporting its students through mandatory awards contributing towards their fees and maintenance. The decision to approve such awards not only flouts the flouted ideology of "independence", but means that licenced from Buckingham cost the Government more than graduates from my other local institution - the Open University.

The OU is the major innovator in this country in all the other areas you identify: access; credit transfer; part-time degrees and distance learning. You record its "reward" for promoting these developments on the front page of the same issue - the cut in its subvention from the Department of Education and Science now matches the worst hit universities under the aegis of the University Grants Committee. Moreover, presumably in pursuit of privatization, supposedly optimized at Buckingham, the fees charged to its students have been doubled. None, repeat none, of these



The Open University (left) and the University of Buckingham.



students receive a mandatory grant and most receive no public support at all although they continue to contribute, through their work, to moderating the economic plight of the country, and, through the taxes they pay, to subsidizing those on full-time courses. The financial assistance the university could offer to the underprivileged, who need it most is exhausted before the queue has been significantly diminished and the university is now effectively closed to

many potential students who cannot afford the price of entry.

How does the Government reconcile this reality with its rhetoric? Could Keith Hampson tackle that in his next apology for optimism?

Yours faithfully,
IAN McNAV
34 Latimer,
Stony Stratford,
Milton Keynes,
Bucks.

Yours faithfully,
A. J. POINTON,
National Secretary,
Association of Polytechnic Teachers.

Dear diary

Sir, - I have read with surprise and amusement the letter from Mr Kirk by (THESE, December 23) accusing the eccentric column "Don't Diary". Whether true or otherwise I find it one of the more entertaining parts of THESE - long may it continue!

Yours faithfully,
CHRIS HACKETT,
Senior accountant,
North-East London Polytechnic.

Strung out

Sir, - May I respectfully point out a minor misprint in Laurie Taylor's column in THESE of January 6. The last four lines should read:

19. Yours sincerely,
20. Peter
21. Swinton
22. Dyer

Yours faithfully,
RON WIGLEY,
222A Danks Road,
Norwich.

Teacher status

Sir, - The recent discussion between Graham Gibbs and Peter Gold (THESE, November 25, December 9 and 30) regarding promotion in polytechnics, again highlights a very important question for any system of education - what is the status of the teaching function?

As a contribution to the discussion, I would like to make the following points.

I am delighted to hear from Dr Gibbs of the encouraging signs of the Standing Committee on Educational Development Service in Polytechnics concerning "rewarding excellent teachers", but I share Dr Gold's scepticism. In recent years, I have been unaware (certainly in THESE columns) of any vigorous defence of the teaching function by members of university/polytechnic education departments. Development units against the onslaught of research and administration I would expect them to be the vanguard of any such movement.

In an article on the literary system (NAB, October, THESE, December 16), the University Grants Committee

chairman is reported as saying that "every teacher has the duty to carry out his or her job to the best of their ability". Sir Peter makes an important distinction which your leader article (October 21) failed to do. B. R. Reilly (THESE, October 28) rightly challenges the generally accepted myth that we "become good teachers by doing research"; a myth propagated by Laurie Sapper at the Association of University Teachers view (THESE, July 11 1980); recently emphasized by the Council for National Academic Awards and restated by your leader article (October 21). "Research" must be encouraged and expanded in its own right. In order to sustain high teaching standards:

3. Teaching expertise and scholarship (not to be confused with research ability) can only be used as a basis for promotion if assessment criteria (along the lines suggested by Dr Gibbs and Gold) are developed and established; and
4. The teaching-learning process must be seen as a continuous, dynamic, and evolving situation. However, do not let us forget that it is within this process that the teaching-learning process must suffer

from many threats to academic freedom, while the teacher unions are unwilling to grasp such a prickly problem. These attitudes must change: before the teaching function can take up its crucial and central position in further and higher education.

I take issue with Dr Gold regarding the value of a student input to the assessment of teachers; his comment on "heaven forbid" portraits (with respect) pedagogic arrogance. Aristotle is credited with the opinion that "you get a better notion of the merits of the dinner from the dinner guest than you do from the cook"; he was right. In my experience, the student voice, unfortunately, is far too little heard in the educational process.

Teachers are under constant pressure to play off their teaching duties against research and/or administration. While this situation pertains the effectiveness and efficiency of the teaching-learning process must suffer.

Yours faithfully,
DAVID A. WRIGHT,
Birkbeck College of Education.

Course ranking

Sir, - Your leading article (THESE, December 23) on the Council for National Academic Awards' involvement in the ranking of courses for the National Academic Awards raises the question as to whether this might best be done by the council or the NAB. Since both the CNA and the NAB draw their membership from the academic community, may I suggest that the key question is whether peer judgment is really feasible.

CNA validation relies on the integrity of the officers and members involved and, at its best, is dispassionate and, at its worst, is slightly inquisitorial. Peter Knight's spirited contribution to this debate suggests that peer ranking might make the validation process unhealthily partisan.

The NAB will have to make quality judgments about courses and it is right that the Inspectorate should provide the advice. There is a strong case that the NAB should also receive peer judgments and the credibility of the CNA as a validating body must be able to provide such judgments and they have validity.

Yours faithfully,
GRAHAM I. STODD,
West Sussex Institute of Higher Education.

Letters for publication should arrive by Tuesday morning. They should be as short as possible and written on one side of the paper. The editor reserves the right to cut or amend them if

ILEA gets tough on art

The Inner London Education Authority is planning to tighten the reins on its art colleges just before the end of the consultation period of its advanced further education review.

The review, the first in London in 10 years, expects all comments on proposals by the end of this month. But a letter went out this week from the authority's chief education officer to the four art colleges and three specialist colleges rejecting the original review proposal of a loose consortium of art colleges, and replacing it with a much tighter, "collegiate institute".

The colleges involved are Camberwell, Chelsea, Central and St Martin's art colleges, plus the London colleges of Printing, Fashion and Furniture. The latter three were not included in the original consortium proposal - the inclusion now of the College of Printing means that the proposal for it to join South Bank Polytechnic also falls.

The letter to the colleges makes clear that although they would retain their specialist character, the new institution would be a single entity, with one governing body and one academic board. It would have at least 6,000 students (full-time equivalent) and would be similar in size to a major polytechnic, the letter says.

The letter also makes clear that the proposal's aim is to increase both financial and academic control. It says that the "institution" would have no resources to be channelled effectively to meet changing needs.

The institute would be funded similarly to the polytechnics, with a block grant. It would provide greater opportunities for centralized management, but also for the ILEA's emphasis on "all through" opportunities from non-advanced to advanced work; for central "new technology" and course reviewing; for supporting academic standards and quality validation; and for the authority's desired emphasis on the importance of relating education and commercial processes to design and research.



One of Scotland's most talented young portrait painters is to spend the next six months as artist in residence at St Andrews University. Margaret Milne, who studied at Duncan of Jordanstone College of Arts in Dundee, will open her first exhibition at the university on February 10.

Confrontation looms over YTS college reductions

Secretary of State for Employment Mr Tom King could face a confrontation with the Manpower Services Commission, after the Youth Training Board this week opposed cuts which would radically change the Youth Training Scheme to the detriment of colleges.

A large proportion of the YTB members objected to the reduction of next year's Mode B provision (scheme run by local authorities and voluntary organizations) from its one third of the total to a quarter. This has been referred to next week's meeting of MSC commissioners.

The commissioners are also likely to object to the cuts and will press Mr King for the partial reinstatement of the grounds that Mode A (employer-based provision) cannot provide for the most disadvantaged youngsters and it is far too early to cut any part of the scheme.

Opposition to cutting Mode B provision by some 70,000 targeted places started at a meeting of the YTB in November. This week members reacted angrily to Mr King's letter to Mr David Young, MSC chairman, on future YTS.

Mr King, not content with MSC proposals to increase the number of

Mode A schemes by reducing Mode B2 (local authority) provision to 20,000, wanting further cuts in Mode B1 (voluntary schemes) from the current 80,000 to 60,000 on the grounds that such schemes are expensive and that young people could be best served by employer-based schemes.

Mr King revised the Mode B1 figure up to 70,000 after representation from the MSC which pointed out that some 88,000 places had already been approved.

Figures released by the commission for January 5 show that only 302,900 young people had entered the scheme

this was still substantially short of the target even after meeting the Christmas undertaking to school-leavers, and with only 4,320 youngsters waiting for an offer.

The breakdown of these figures shows that some 212,700 young people were on Mode A schemes, 67,600 on Mode B1 and 22,600 on Mode B2. According to the Association of County Councils, one of the bodies represented on the YTB, these figures show that there is no basis for cutting back Mode B on the grounds of unfilled places as this equally applies to Mode A provision.



overseas news

France launches reading campaign

from Ian McGregor

PARIS

The French government has launched a national campaign against illiteracy among young and old. The Minister of Social Affairs and National Solidarity, Monsieur Pierre Bergovoy, has announced a programme of specific measures to be taken this year, with more to follow in 1985.

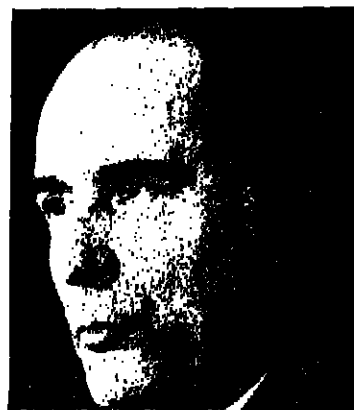
They include the creation of a permanent commission funded by his ministry, the enhanced use of information technology in the struggle against illiteracy, a national coordination of local literacy campaigns, a development of special libraries and resource centres, and a national system of teachers trained specifically for the field of adult literacy.

The discovery of a marked level of illiteracy in France has come as something of a shock to national politicians if not educators, and the distinguished daily newspaper *Le Monde* saw fit to comment on its front page the day after Bergovoy's announcement: "Illiteracy is not the sad privilege of the third world. There are now over 8,000,000 French people over the age of 15 who according to Unesco's definition, are incapable of reading, writing and understanding a short and simple text related to their daily life".

The surprised response to, and extensive media coverage of the Minister of Social Affairs announcement is enhanced by the fact that just five years ago France responded to a Unesco-European Commission Inquiry on illiteracy with the reply that "it does not exist in France".

But growing unease in educational circles led the Mitterrand administration to establish an inter-ministerial commission in the summer of 1982 to "attack the problem of illiteracy and the conspiracy of silence surrounding it".

The commission's 147-page report *Illiteracy in France* has now been issued, reporting conclusions of the National Institute of Pedagogical Research and other sources, to the effect that perhaps 15 per cent of the French



Mitterrand: Inter-ministerial commission

are totally illiterate, that only 25 per cent can read easily in their language, and that the remaining 60 per cent read only with difficulty.

The report acknowledges the difficulty of measuring levels of illiteracy with precision, notes the trans-class

nature of the phenomenon, and draws attention to the "stratagems, tricks and taboos associated with it".

But one study in the schools in the Nice area notes that 20 per cent of children there can be considered functionally illiterate, while the Ministry of Defence, which tests armed services recruits each year, reaches similar conclusions.

Already numerous agencies are engaged in counter-illiteracy work, from education and culture in Rouen and Action Lire in Saumur to the National Association Française pour la Lecture.

Last autumn, the inter-ministerial commission noted that illiteracy was a major obstacle to social integration, and now it reports that "illiterates are excluded because they cannot read - and because they cannot read, they are excluded".

And it adds, "the level of complete illiteracy may still be low - but the number of people who have not mastered reading and writing must be counted in the millions rather than the hundreds of thousands".

Failing on the learning

from Geoff Maslen

MELBOURNE
A survey of students' learning processes at the Australian National University has shown little evidence of an increase in critical and analytical thinking as students progress through their degree courses.

Results of the survey revealed that many mature students, particularly those enrolled in the faculty of arts, were intrinsically motivated and were utilizing "deep level" learning strategies early in their tertiary studies. But school-leaver entrants were much more likely to rely on rote-learning to cope with their first year studies at the university, and often they were still using the same methods two years later.

The survey, by David Watkins of the Office for Research in Academic Methods, was based on a questionnaire developed at the University of Lancaster. It was answered by more than 500 students in their first year at ANU in 1980. A follow-up survey was conducted of 370 of the students still in the university two years later. Although the researcher expected students to reveal marked intellectual growth in order to cope with the complexities of more advanced studies, many students told him that rote learning was all that was needed at ANU.

The survey results also contrast with a national study by two University of Newcastle researchers which found that Australian university students tended to use a deep approach to learning, compared with college students who applied surface methods. The researchers also found that some learning environments tended to elicit a deep and others a surface approach. Didactic teaching and emphasis on final examination, for example, were characteristics of tertiary teaching associated with the surface approach. They said that to use a deep approach, students needed to be intelligent, already knowledgeable in the area under study, be able to concentrate for long periods and be able to organize themselves and their resources.

At the ANU, Mr Watkins failed to find evidence to support two more of his hypotheses: that students who withdrew from the university would have poorer, more superficial study methods and would be less satisfied and less motivated than those who persisted; and that the differences in learning strategies utilized by students in different faculties to achieve deep level learning outcomes would become more pronounced in later years.

He said that one of the few positive results of the survey was that later year students reported a decrease in "globetrotting" - jumping to conclusions without sufficient evidence.

Commenting on why entrants to ANU straight from school left university without a deepening of their learning processes, although older students appeared to arrive with motivation and keenness for deep-level study, Mr Watkins suggested mature students were among those in the community already motivated and using independent learning strategies.

He also wonders as to the policy objectives that a loans system may be calculated to serve in Irish conditions. Mr O'Leahare made a study of schemes operating in the United States where the rise in the total amount of new loans has been remarkable. In 1967, under-all federal insured programmes the amount of new loans was about \$250,000m but by 1980 the figure had jumped to nearly \$4 billion.

One reflection of these continuing trends, he said, is that graduate students in the States are stretching out the time they actually spend in school, adding an average of two-and-a-half years during the past decade (from 8.7 years to 11.2 years from receiving a baccalaureate and finishing a doctorate).

Conference participants were greeted with a series of reports which had just surfaced investigating the current state of graduate learning. Surveys from the Graduate Record Examinations Board and the Council of Graduate Schools in the United States show that while applications are on a decline, students are on the rise.

In the academic year ending last spring, some 14,340 doctorate degrees were awarded, representing a 3.5 per cent increase over the 1980/82 figure of 13,827. The number of students in the number of some 15 years ago.

Most students who never considered attending a graduate programme, though, indicated that money was not a major factor. Of these, 31 per cent attended private undergraduate institutions, and 40 per cent were from public schools. In public and ethnic groups, more black students said they would not attend graduate school because of financial constraints (59 per cent at private institutions).

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overseas news

Arms control grants awarded

from E. Patrick McQuaid
CAMBRIDGE

The Carnegie Corporation says it will award between \$5m and \$7m annually to train "a new generation" of arms control experts and has announced substantial grants to Harvard and Stanford universities for research aimed at reducing the risk of nuclear war.

At Stanford, a four-year \$905,750 grant is to fund annual fellowships for mid-career scientists interested in arms control. It will also support a multi-year project on US-USSR "crisis prevention and crisis management." At Harvard, an award to the Kennedy School of Government is expected to "institutionalize" work carried out by Boston area scholars from a variety of fields and colleges who have been exploring what factors might lead to a nuclear exchange and what alternative responses might prevent one. The Harvard grant is for \$491,100.

Stanford's Professor John Lewis, director of the university's Centre for International Security and Arms Con-

trol, estimated that the combined total expenditures by the nation's five leading research universities in arms control studies was less than \$1m annually. Mr Lewis, a specialist in Chinese politics, has appointed Professor Sidney Drell, a physicist, as his co-director and head of the Carnegie-funded project. The Soviet-US study is under the direction of Professor Alexander Grant, a political scientist who last year was awarded a MacArthur fellowship.

The president of the Carnegie Corporation, Dr David Hamburg, a psychiatrist and former lecturer at both Harvard and Stanford, and president-elect of the American Association for the Advancement of Science, said additional grants will be announced during the year. He said they will be made to "flagship" institutions, major study centres that have already focused considerable attention on the risks of nuclear war.

In the years since the last war, a distinct community of arms control experts that spans traditional academic and professional disciplines has de-

veloped out of the long established cooperation of scientific and technical specialists with scholars from the social sciences, law, and the humanities. Many of these experts are now approaching retirement and the Carnegie grants seek to contribute to the training of a successor generation, according to statements.

The Stanford centre is truly a cross-disciplinary venture, drawing on talent from a host of major research universities and private industries. Staff include Mr Ryukichi Imai, an engineer and ambassador for the Japanese Ministry of Foreign Affairs, Mr Herbert Abrams, a Harvard radiologist, Mr Jack Evered, a geophysicist with the US Geological Survey, Mr Albert Wheelon, a physicist for Hughes Aircraft, and Mr Joshua Lederberg, a geneticist and president of Rockefeller University.

Similarly, the work by Boston area academics is cross-disciplinary but informal, almost "vocational" according to Carnegie representatives. The grant will give scholars an institutional base.

Scientists queue for the circus

India's 71st science congress ended with a 30-point programme for upgrading science and higher education concentrating on quality rather than quantity.

The Indian Science Congress Association was founded in 1913 on the model of the British Association for the Advancement of Science. It proceeded last week to set its own house in order by limiting ISCA membership to practising scientists.

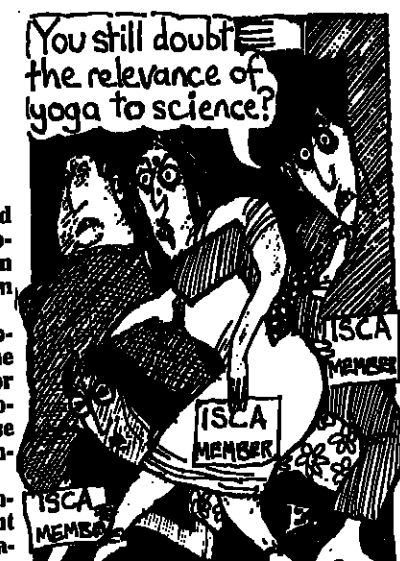
Under the present rules any science graduate can arrive and take out temporary membership for the duration of the annual congress on payment of a nominal fee.

The resulting crowds have in recent years earned the congress the unofficial epithet of "science circus". The chaos at this year's gathering included the non-arrival of delegates and conference bags.

This resulted in the exclusion of several VIP visitors from the opening ceremony, since the bags contained the security passes necessitated by the presence of the Prime Minister, Indira Gandhi.

This was partly due to a last-minute change of venue from Ranchi University to the Birla Institute of Technology 15 kilometres away. The presence, at one time or another, of 3,000 participants instead of the expected 4,000 only added to the chaos.

Overcoming these difficulties was all the more important since in recent years the congress has acquired a



keynote theme on which it makes recommendations to the relevant government bodies which report back on action taken the following year.

This year's keynote theme was "Quality science in India, ends and means" and the recommendations, seemed addressed as much to the academic community as to the bureaucrats and planners.

They included: standardization of PhD requirements (some universities are notoriously "easy" in awarding higher degrees); "necessitating schools" for highly gifted children; greater accountability for research funds; and the "delinking" of civil service entrance from higher education, to take pressure off the universities which are at present besieged by applicants for whom a degree is simply a passport to a job.

Social Democrats give small boost to research

from Donald Fields

STOCKHOLM
Higher education and research will be slightly less badly than the overall economy as a result of the Swedish Social Democratic government's latest attempt to lift the country out of the economic mire.

In the 1984/85 budget, published on January 10, SKr6,360m (£530m) have been allocated - a 4.3 per cent increase on last year, compared with a 4 per cent boost to government expenditure as a whole.

The Social Democrats have curbed spending on industrial subsidies, communications, and employment measures to prepare for a fresh phase of economic expansion.

Although the government is committed to halve the recent inflation rate, Sweden's 33 institutions of higher education, located in 25 towns, will be hard pressed to maintain their standards. There will be no basic increase in the number of first-year students.

The universities will shift their emphasis somewhat towards technical and economic disciplines, while 344 places will be created for students of data systems.

Financial assistance, for which 183,000 students and senior pupils in other forms of education are eligible, has been slightly increased.

The government has promised to table a separate Bill on research this spring. Examination of the ministry of industry's expenditure allocations reveals that academics involved in industrial research would currently do better to concentrate on energy and communications satellites rather than other forms of technological development.

There is some overlap in the provision of post-school facilities in Sweden. The adult education segment is expanding proportionately more than university education, though the margin is minimal. In the next academic year 315,000 Swedes will be enrolled in adult education courses at 123 centres financed by local authorities.

Tamils fast in protest

from D. B. Udalgama

COLOMBO
Tamil undergraduates who fled the southern universities during the anti-Tamil violence in July were staging a fast at Jaffna University, pressing their demand for admission to Jaffna or Batticaloa, when the new academic year started this month.

Students at Jaffna are reported to have staged a token strike on the opening day in sympathy with their fasting brethren. Even freshmen admitted to the university had not registered.

In the other universities, some 300 to 400 students, also admitted this academic year, have failed to register themselves, according to the University Grants Commission. There has been no statement about the racial breakdown of these students, and the UGC version is that they are among the candidates who have been admitted to the "less prestigious" courses and are probably waiting to make another bid next year for admission to the "prestigious" courses.

The UGC has set a deadline for new students to register, failing which their places will be filled from among other candidates who have qualified.

The deadline has been set, according to the UGC, because the university calendar has been "telescoped" into a tight schedule, and students who come in a fortnight or so after the opening day will find it difficult to follow courses.

During the Christmas vacation a police station was set up at the Peradeniya University - the first in a university anywhere, the vice-chancellor, Professor B. L. Panditharatne is reported to have said. Both the vice-chancellor and the inspector general of police, Mr Rudra Rajasingham, who took part in the opening ceremony, said that the police were there to protect and guide students, not to harass them.

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Germany to get elite university

A private German "elite university", associated with foreign minister Hans Dietrich Genscher in a controversial speech last month, will come into being before the end of the year. The first private university for tomorrow's top German industrialists and managers is to open in Koblenz in October.

The project was presented by the organizers, the Chamber of Industry and Commerce of Koblenz and Professor Udo Glittenberg, an experienced teacher at the "European Business School" in Bonn last week. They said they had already collected some DM6m in donations.

Scoring a credit

Senior students in Class EE91 in the electrical engineering college of the California Institute of Technology (CIT) can receive academic credits for work on an independent project. Ted Williams aged 21 and Dan Kegel, aged 20 will get for them an ingenious and audacious computer-assisted practical job.

For the 1984 Rose Bowl football match at Pasadena, between University College of Los Angeles and Illinois University, the two electrical engineering students programmed the electronic scoreboard to show two colleges that give learning and research priority over football, namely CIT and the Massachusetts Institute of Technology.

The professors had programmed the scoreboard under the eyes of security guards.

Clearance row

The "independent" homeland government of Ciskei has stipulated that students applying to study at the University of Fort Hare will have to have clearance from the Ciskei intelligence service.

The move has stirred a strong controversy among Fort Hare students, the majority of whom are not Ciskei residents.

In a fairly typical case, a scholar like Yale University's Jaroslav Pelikan, to invest considerable time and energy into a massive and exceptional study called *Unfinished Revolution* and then call his product "a little book". Those attending a recent symposium at Princeton, during which his findings were reported, might consider his description a calculated understatement.

The presentation by Mr Pelikan, an historian and former dean of the Yale Graduate School, was far more dramatic than his essay, commended by the Carnegie Foundation for the Advancement of Teaching. He told an audience of nearly 100 university presidents, graduate school deans and foundation executives.

"I have a nightmare that during this final sixth of the twentieth century we shall be able to attract into graduate study and into scholarly careers substantially less than our fair share of the most promising college graduates." These potential scholars, he suggested, are right now being siphoned into medical, law or worse - business schools.

Of those who did opt for graduate school, "the very best continue to be very good indeed, but the quality does seem to be dropping off faster and

Study reveals Swapo plans on illiteracy

by David Jobbins
and John O'Leary

A massive expansion of teacher education and a determined drive to wipe out adult illiteracy are priorities for an independent Namibia under the liberation movement Swapo, according to a study published today.

Faced with chronic skill shortages, few qualified teachers and 60 per cent illiteracy, Swapo leaders have attached immense importance to developing and reconstructing Namibia's South African designed education system after independence.

Latest figures, for 1980, show that of Namibia's 4,887 black teachers only 18 had degrees and the vast majority had not reached secondary school level. Nearly 2,000 had had no teacher training.

According to the United Nations Institute for Namibia, the country would need more than 6,000 new teachers to carry out the priority programmes, twice as many extra skilled personnel as would be needed in the second priority area, health.

The total scale of the anticipated skill shortage is demonstrated by estimates indicating that 22,000 black Namibians would be needed immediately after independence to swell the present 30,000 jobs in agriculture, mining, industry, government and other areas to 55,000.

The literacy programme would need at least 4,000 part-time and 200 full-time educators at a cost of R10m. An important source of staff could be demobilized guerrillas working through established structures for reaching the community including churches, farmers' groups, women's and workplace organizations and youth groups, the report says.

The author of the study, Justin Ellis, was expelled from Namibia in 1978 when he was working for the Christian Centre, and reporting for the BBC.

His administrative office for the

Irish loans warning

from John Walshe

DUBLIN
Irish education minister Gemma Hussey has been warned of the dangers of rushing through a student loans scheme before the commencement of the next academic year.

The warning has come from the chairman of the Higher Education Authority, a statutory body which funds the universities and advises the minister on third level education.

The chairman, Mr Dominic O'Leahare, says that rushing through a scheme could open the way to grave risk of financial loss rather than gain because retrieval of a defective loan scheme, once adopted, could be very expensive.

His warning comes as government consideration of a loans scheme nears conclusion. Some ministers and their officials believe it could be introduced before the autumn. They argue that a scheme administered through the banks and coupled with massive tuition fee rises could save the government millions by cutting direct state aid to colleges.

In his memorandum to the minister, the HEA chairman agrees that a loan system could, perhaps, operate to reduce state expenditure. "But one needs to be certain that it will do so and that the immediate cost is not insupportable nor the consequences for higher education institutions too serious", he writes.

He also wonders as to the policy objectives that a loans system may be calculated to serve in Irish conditions. Mr O'Leahare made a study of schemes operating in the United States where the rise in the total amount of new loans has been remarkable. In 1967, under-all federal insured programmes the amount of new loans was about \$250,000m but by 1980 the figure had jumped to nearly \$4 billion.

One reflection of these continuing trends, he said, is that graduate students in the States are stretching out the time they actually spend in school, adding an average of two-and-a-half years during the past decade (from 8.7 years to 11.2 years from receiving a baccalaureate and finishing a doctorate).

Conference participants were greeted with a series of reports which had just surfaced investigating the current state of graduate learning. Surveys from the Graduate Record Examinations Board and the Council of Graduate Schools in the United States show that while applications are on a decline, students are on the rise.

In the academic year ending last spring, some 14,340 doctorate degrees were awarded, representing a 3.5 per cent increase over the 1980/82 figure of 13,827. The number of students in the number of some 15 years ago.

Most students who never considered attending a graduate programme, though, indicated that money was not a major factor. Of these, 31 per cent attended private undergraduate institutions, and 40 per cent were from public schools. In public and ethnic groups, more black students said they would not attend graduate school because of financial constraints (59 per cent at private institutions).

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E. Patrick McQuaid on a Princeton symposium
Historian's nightmare

Further than it once did". Mr William Bowen, president of Princeton said that while anecdotal and "fragmentary evidence indicated that the calibre of today's PhD candidate was not encouraging, poor scholarly job prospects coupled with simple demographic shifts would add up to fewer and fewer graduate school enrolments.

For the short-term forecasts, said Mr Bowen, the number of new PhDs would continue to outpace the volume of employment opportunities three to one. Professor Bowen, in an expostulatory and droll manner prepared for a Princeton study, he estimated that for roughly 30,000 doctorates awarded in any year there will be only 10,000 openings for colleges and universities.

Almost a third of the 1982-83 crop is still out of work or in grave doubt over its academic future, when Mr Bowen presented his

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US poised to set out human research policy

The US government is expected to release a uniform policy on human subject research for the 22 federal agencies sponsoring such experimentation and reporting to the Department of Health and Human Services.

While the regulations have been approved by each agency and await only the rubber stamp of the White House Office of science and technology policy, an advisory body to the National Institutes of Health has proposed that an entirely new panel be created to review research proposals concerning "gene therapy on humans." The committee would be composed of scientists, ethicists, and theologians.

The proposal is in anticipation of applications from geneticists at the San Francisco and San Diego campuses of the University of California. Scientists plan to petition the national institutes Recombinant-DNA advisory committee and the Federal Food and Drug Administration for permission to genetically alter bone marrow cells of subjects with genetic disorders. The requests will mark the first occasion for genetic engineering on humans that the government has received.

According to reports, it appears likely that the NIH will approve of the California experiments, which are not expected to cause complications for the subjects. The proposal to allow philosophers and religion scholars to review similar research requests, however, has set off heated arguments in the scientific community.

At the moment regulations on human subject research are issued separately from each federal agency. Because colleges and universities are often receiving financial support from more than one agency, they are confronted with more than one set of rules. Under federal regulations,

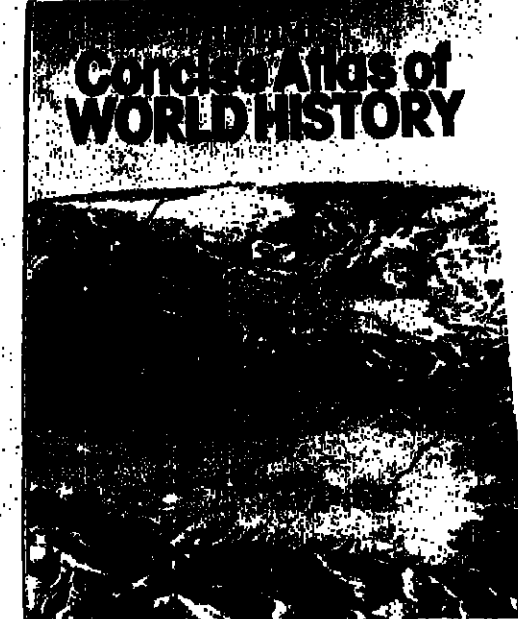
though, each institution has an independent review board to monitor research and compliance. Under federal authority, no other campus body or individual can overrule any board decisions.

The focus of the new policy is "informed consent," which sponsors say involves far more than having subjects fill out forms signing over their bodies. Most social science and education programmes were exempted from the Department of Health and Human Services rules on human subjects, revised in 1981. These apply to studies relying on surveys, interviews, observations of public behaviour and the review of documents or specimens. Privacy rules still apply, though, and the names of participants in studies of school practices and tests, for example cannot be used without formal consent.

Meanwhile, debate continues over the use of animals in laboratory experiments. The Massachusetts state legislature has passed a law forbidding medical researchers from taking animals - specifically dogs - from public pounds. Currently, they may purchase unclaimed animals after 10 days in the pound.

The legislation awaits, and is expected to get, the governor's signature. If enacted, the law provides that after three years (it will go into effect one year from signing) researchers will also be forbidden to import pound animals from other states. If enacted, local universities may have to establish costly dog breeding facilities.

Harvard has reversed an earlier decision to oppose the legislation, reportedly in hopes of preventing a referendum from getting on next November's municipal ballot that would place very strict limitations on live animal experimentation.



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THES peer review

Searching for an elusive quality

Quality assurance has rocketed up higher education's agenda over the last year. In the universities, the vice chancellors have set up a committee under Professor Philip Reynolds of Lancaster to examine all aspects of this question, including validation. In the polytechnics and colleges, the Inspectorate has begun to have a sharper impact and the Council for National Academic Awards has become embroiled in the controversial question of ranking courses.

A superficial observer might conclude that British higher education has begun for the first time to be seriously concerned about how academic quality can be measured. Now that the present Government's austere public expenditure regime means that not all institutions can be guaranteed a steady rise in resources, and that many in fact will have to absorb serious cuts, quality judgments must be made to sift the excellent from the not-so-excellent.

Although the cuts of the last three years have concentrated more attention on measuring quality, this view is misleading in an important sense. British higher education has always been concerned about quality; the high academic standards achieved and maintained in nearly every university, polytechnic, and college are witness of that.

But quality assurance has traditionally been regarded as a private affair, without immediate consequences for the distribu-

tion of resources. The paraphernalia of external examining in universities is designed to guarantee the common coinage of the gold standard. The work of the CNAAs is to guarantee that degrees in polytechnics and colleges are of an acceptable standard. Both systems, despite their procedural differences, have the same intention: to set the threshold of acceptability.

Today the drift is away from the large passive assurance of quality towards more active judgments about quality. As a result, the threshold is no longer regarded as sufficient; it has now to be supplemented by quality ranking, as the CNAAs and the Inspectorate did with town planning courses in the non-university sector last autumn and as the University Grants Committee did in 1981 covertly and implicitly.

This is the background to our third attempt to carry out a survey of "best" departments, which this time covers English, business and management, and biological sciences. The detailed results are given below and on the facing page.

As with the two previous surveys, the results are mixed. On the one hand the exercise seemed to provoke less outright opposition. The response rates were significantly higher - except for medicine which was so low that the survey had to be abandoned and may say something about how medical schools see their relationship with the rest of higher education.

There were fewer replies of the "mind your own business" variety, although the more legitimate objections to such subjective survey were still strongly expressed. Perhaps this simply reflects that THES surveys of "best" departments have become more familiar; perhaps a more subtle shift in opinion towards accepting that quality ranking for better or worse has become a public issue which must be faced.

On the other hand, the three subjects covered presented greater difficulty. The first two surveys covered relatively homogeneous disciplines. The latest one deals with three areas that present serious problems of definition. English is conventionally, and often rigidly, divided into language and literature, with linguistics hovering in the foreground or background. Biological sciences cover several distinct and independent subjects: biochemistry, microbiology, botany, zoology and so on. Business and management is a hotch-potch of academic study and professional practice.

The difficulty that this diffuseness caused many respondents is very important. If quality ranking has become an important item on higher education's agenda, another is the restless movement towards vocationalism. Vocationalism almost certainly implies a shift away from tidy coherent academic disciplines with settled patterns of thought and demar-

cated frontiers. If Government rhetoric is to be taken at its word, the future will belong to the loosely-coupled subject areas like business and management - precisely the areas in which it is most difficult to make quality judgments that are defensible.

But it is wrong to exaggerate the diffuseness of the results of the survey. All three subjects produced a clear top 10 departments, about the identity of which there is a strong consensus. In English: Oxford, Cambridge, University College London, Edinburgh, Birmingham, York, Newcastle, Manchester. In business and management: the London and Manchester Business Schools, Warwick, Lancaster, UMIST, Bath, Aston, Cranfield, Bradford, and Imperial College. In biological sciences: Imperial and University College London, Cambridge, Oxford, Edinburgh, Sussex, Birmingham, Dundee, Bristol, and Glasgow.

Of course there is endless scope for detailed arguments about these lists. These are important. But perhaps more important is the larger question of whether these inevitably one-dimensional and conventional pecking orders, which might have served when they had no operational significance, can still be regarded as adequate now that they are being linked more and more to immediate and important decisions about the future of institutions.

What the questions were...

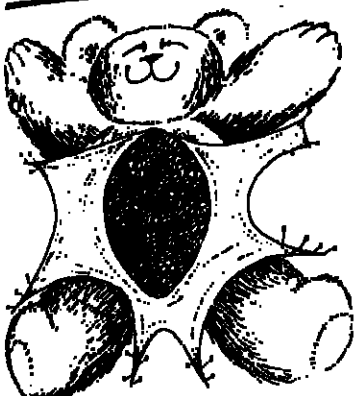
The same questionnaire was sent to the heads of department, school, or faculty in English, biological sciences, and business and management.

1. Which in your view are the five best departments in British higher education institutions in your subject, bearing in mind mainly the output and quality of their research? 2. Which in your view are the five best departments in your subject in British higher education institutions, bearing in mind the quality of their teaching of undergraduate students? 3. How much external funding in terms of research grants and external support did your department attract over the past three years? 4. In the last five years how many books or articles have been published by members of staff in your department? 5. Can you please give some indication of the average Universities Central Council on Administrations score of undergraduate entrants to your department? What is the highest and the lowest score in the past three years? 6. Excluding your present department, in which department would you most like to hold an academic post, in Britain and in the rest of the world?

The tables were compiled by awarding five points for a first place, four for a second, and so on. These scores were then added up to produce a ranking order. No advice was given on whether it was proper to vote for one's own institution, but some who replied clearly felt inhibited in doing so. Parity for this reason totals of five and less are grouped at the end of the table because, in a few cases, these represent a single narcissistic vote.

Seventy-eight questionnaires were sent to heads of English departments, and 29 were returned, of which 20 were complete. This represents a response rate of 37 per cent. In biological sciences, 87 questionnaires were sent out and 42 returned (30 with all questions answered), a response rate of 48 per cent. In business management 64 were sent out, and 32 returned (24 complete), a response rate of 50 per cent.

In general these response rates are higher than in our first two surveys of English language and literature, "best" departments. But an attempt to survey medical schools was entirely unsuccessful.



BIOLOGY

Biological sciences remained defiantly in the plural. Unlike physics and chemistry, the two previous science disciplines covered by THES surveys, biology refused to be reduced to the singular. Or, perhaps more accurately, as it takes up six of the University Grants Committee's subject classifications, its constituent disciplines declined to be amalgamated into a homogeneous supra-discipline.

Most respondents felt that it was, just about, possible to regard biology as an entity for teaching purposes, although a significant minority believed that even this was going too far and an even larger number was inhibited because their knowledge of other departments was anecdotal or prejudiced.

But nearly all respondents agreed that it was absolutely impossible to assess research excellence except in the context of biology's constituent disciplines - and then proceeded to provide a research pecking order that was far firmer than their ranking of teaching merit. So the rankings produced by our survey need to be treated with more than usual caution. The eminence of Cambridge, Imperial College, Oxford, Edinburgh, Sussex and University College London in biological research is an unstable amalgamation of their detailed reputations in biochemistry, botany, zoology, physiology and so on.

Research rank Teaching rank

1. London (of which: Imperial College)	82	1. Cambridge	59
2. Cambridge	54	2. Oxford	31
3. University College London	21	3. London	20
4. Queen Elizabeth College	5	4. (of which: Imperial College)	10
5. Queen Mary College	3	5. University College London	9
6. Cambridge	78	6. Glasgow	1)
7. Oxford	43	7. Edinburgh	16
8. Edinburgh	25	8. Hatfield Polytechnic	16
9. Sussex	23	9. Sussex	14
10. Birmingham	18	10. Leicester	13
11. Dundee	15	11. Bath	13
12. Bristol	14	12. Birmingham	12
13. Glasgow	14	13. Bristol	10
14. Bangor	12	14. Durham	10
15. Leicester	11	15. Lancaster	10
16. Manchester	9	16. Glasgow	8
17. Sheffield	8	17. Portsmouth Polytechnic	7
18. Liverpool	8	18. Plymouth Polytechnic	6
19. Warwick	7	19. Liverpool	6
20. Durham	7	20. Manchester	6
21. Bath	6	21. Manchester	6

Also mentioned: Aston, Portsmouth Polytechnic (5); Exeter, Strathclyde, Aberdeen, Plymouth Polytechnic (4); Open University, Lancaster, Brighton Polytechnic (3); Reading, Newcastle, Southampton, Preston Polytechnic (2); and East Anglia, Hatfield Polytechnic (1).

On the other hand the weight and unanimity of opinion were such that this qualification, however essential, may not in fact affect the outcome. Even in institutions with unified schools of biological sciences the difficulty created by the uneven effect of detailed subject bias did not disappear. One head of a university school pointed out that although it covered a wide range of biology - biochemistry, biophysics, ecology, genetics, microbiology, plant biology and zoology - his response was instinctively weighted towards reputations in his own specialty of biochemistry.

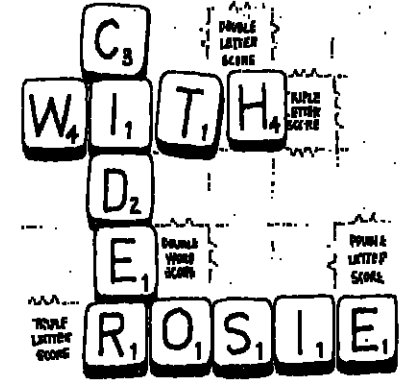
ENGLISH

English should be a discipline in which the comparative merits of departments are open to scrutiny. In its guise as literature English encourages the formation of strong opinions based on moral and aesthetic values; in its guise as language it stimulates their expression in clear and articulate terms. In fact, any ranking of English departments is marked by the same mixture of near unanimity and endemic confusion as the ranking of departments in other less cohesive disciplines. There is almost complete agreement about which are the strong English departments in research and substantial agreement about the best teaching departments. But there are also important structural and ideological fissures within the discipline which mean that this apparent unanimity is relatively superficial.

First, the unanimity. Oxford (first) and Cambridge (second) are out in front in research, which will surprise no one although the actual precedence they merit is debatable. Next came London (well, University College mainly, with King's also favoured), Edinburgh, Birmingham, York and Newcastle.

In teaching almost the same institutions are favoured, although in a different order. Cambridge, for instance, comes fourth; a comparative judgement that may reflect the effect of the traditional wars of the English faculty there. Bristol, Sussex, East Anglia, Manchester and Liverpool are also regarded as strong teaching departments. Sheffield City Polytechnic is also up there, high in the university league.

Other institutions have unified English departments. Oxford again divides between language and literature, but only one of the other. Finally, some institutions have separate ling-



A third reaction was to seek further refinement. Another respondent suggested that research reputations should be measured under three headings: language, medieval, and modern (ie post-Renaissance) literature. He put Oxford top in the latter two categories but did not include it at all in the first, where he thought Edinburgh was best.

The second qualification arises from the civil war within English which have been at their most intense in Cambridge. The main battle may have been between the structuralists and their fellow-travellers and more traditional literary critics but there have also been many other skirmishes on related and even unrelated academic issues.

One professor pointed out that he could not answer the impressionistic questions because these depended on one's view of the subject. "I could ask the subject group to vote, but the outcome would be the marginal victory of either the traditionalists or those enthusiastic about new approaches," he commented.

From a rather different point of view a polytechnic head of department

THES peer review

disparates are dumped under one heading. A fair point. A subsidiary point made by more than one polytechnic respondent was that it was unfair to measure research excellence in the two sectors of higher education by common criteria. A typical comment: "Because of different resources bases universities and polytechnics are on different scales in this field. As far as polytechnics are concerned, Plymouth and Portsmouth seem to me to be 'a street' ahead of all others in research output."

The general fear that research, and to an even greater extent teaching, rankings were inevitably based on insufficient information filled out by unreliable gossip was also strongly expressed.

A professor who heads a zoology department commented in these terms: "Cambridge and Oxford (in that order) would probably still be seen as having slightly more good people than other departments. Beyond this I suppose Sussex and OMC London might be included, but Sussex doesn't cover the diverse areas of animal biology that departments like Cambridge, Oxford and Manchester cover."

But in general views of teaching quality in other departments were largely impressionistic. A typical comment about universities: "A good research department like Cambridge rather skimps on some parts of teaching. The London colleges and the big provincial departments tend to have a long tradition of careful instruction, but there may be more innovation in the newer 'green field' universities."

Some clearer idea of the range and ambiguity of research and teaching reputations in biological sciences by looking in more detail at five departments or faculties, three universities, Sussex, York and Liverpool, and two polytechnics Plymouth and Hatfield.

Sussex has been most successful in attracting external money for research, £3.1m over the past three years, and also has the most impressive publication record: its 41 members of staff produced 21 books and 688 articles over the past five years. York is much the centrifugal constituent disciplines which made it difficult to answer

in the broader context of biological sciences but the sheer difficulty of acquiring reliable and reputable information. So the teaching pecking order was produced by an uneasy amalgamation of views acquired through external examining, information fed back by sons and daughters and other relatives who had studied biology as undergraduates, and broad impressions based on gossip grapevines.

So it is not surprising that there was much more disagreement about the best teaching departments. Naturally there was some correlation between research and teaching reputations, with Cambridge first in both lists and Oxford, Edinburgh, Sussex and Birmingham in both top tens.

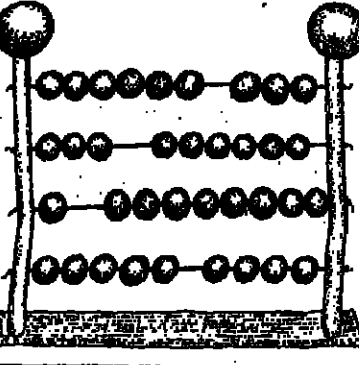
But the polytechnics were much better represented on the teaching list which no doubt reflects that universities and polytechnics are competing on more equal terms in teaching, that polytechnics are thought to pay more attention to careful teaching, and that their graduates have begun to be noticed in university biology. The reputation of Hatfield Polytechnic in particular is remarkable. But in general views of teaching quality in other departments were largely impressionistic. A typical comment about universities: "A good research department like Cambridge rather skimps on some parts of teaching. The London colleges and the big provincial departments tend to have a long tradition of careful instruction, but there may be more innovation in the newer 'green field' universities."

Both Sussex and York have a school of biological sciences. At Liverpool the arrangement is more typical of the older civic universities with six departments scattered across the faculty of science (botany, biochemistry, genetics, marine biology, zoology and microbiology). Between them they accumulated £2m of external research funding and their 66.5 members of staff produced 22 books and 899 articles.

The two polytechnics present an interesting contrast. Plymouth attracted 2650,000 worth of external grants and its 32 staff produced six books and 142 articles. Hatfield attracted £150,000 and its 34 staff wrote four books and 104 articles. But in terms of the quality of their students, the positions of the two polytechnics were reversed; the average A level score at Plymouth was 6 and at Hatfield 7.5, which put it closer to the bottom of the university league than to the top of the polytechnic league.

The highest average A level score reported by a university was Durham's biology department with 11.7. Close behind were York at 11.48 and biochemistry at Birmingham with 11.4. Most universities fell in the 8.5 to 10.5 band.

Favourite institutions (other than one's own) in Britain were inevitably Cambridge and to a lesser degree Oxford, Bath, Cardiff, Imperial, Edinburgh, Sussex and Hatfield Polytechnic were also mentioned. Overseas, Harvard was the most popular choice followed closely by Berkeley, Santa Barbara, Riverside and other campuses of the University of California. MIT, Cornell and Stanford were also mentioned. Melbourne and Toronto were the only non-US universities favoured. A final comment from a (Scottish) disjunct: "I dislike these subjective exercises. What is your audience? Parents, school pupils, intending post-graduates? The UGC equates high research level with academic excellence and (presumably on this basis) six schools of biology expanded. Are these six necessarily better than six or 20 others over all research and teaching fields? One only knows well one's own research subject area and colleagues, and a bit more, and it is dishonest to judge otherwise."



Business and management

Business and management studies may be a single subject classification in the University Grants Committee's list. But on the ground it looks very different - a bewildering array of undergraduate and postgraduate courses, of business studies and more specialist subjects like finance, at initial and continuing education, of research and consultancy, of free-standing business schools and internal university and polytechnic departments.

All this makes our attempt to list the "best" departments particularly hazardous. For a start, the conventional separation between teaching and research is strained in a fashion quite unlike that experienced in almost any other discipline. When much of teaching is short course work and much of research is consultancy even these reliable categories become quite wobbly.

A business school director listed five difficulties which he encountered in his attempt to fill in our questionnaire. The first has already been mentioned: the bewildering variety of activities under the business and management studies umbrella. In place of "teaching" and "research" he suggested five categories: business studies, degrees for undergraduates, postgraduate management masters or diploma courses, short courses for working managers, joint development/consulting work, and research.

His second difficulty was the inevitable complaint that the field covered many academic disciplines - economics, law, sociology, psychology, mathematics and statistics - and professional disciplines - marketing, accounting, industrial relations, operational research. So business schools were made up of a jumble of specialists. The third difficulty was that business and management had become a test bed for experiments in methods of

teaching and learning - from straight rote learning from lectures and books through cases, live projects, joint development activities. People have their preferences and prejudices about them.

Fourth came a special difficulty about postgraduate work which mixed long and short courses, pure and applied research at both masters and doctoral level, course work and dissertation in almost endless variety. Fifthly, the dimension of quality was particularly elusive.

His final difficulty was that there were fundamental differences of organization between free-standing business schools and business and management departments that were part of the normal faculty structure. A further complication was that some of the best work might be done in quite different departments.

These objections were backed up by another professor who complained: "There is a failure to recognize that, with the possible exception of the London Business School, most business schools in the UK are of a federal nature and it is difficult to generalize about them as entities. More specifically, they may be strong in one area (eg operational research) and weak in

another (eg industrial relations and personnel management)."

It was clear too from some replies that some people had entirely excluded the postgraduate business schools and confined their comparisons to departments offering first degrees in the field. This has probably led to a substantial undervaluing of the teaching reputations of the London and Manchester Business Schools, Cranfield, Henley, and similar institutions.

The eventual outcome, however, is a ranking about which there is remarkably little dissent. Indeed the consensus seems so clear that the very necessary qualifications and objections are probably overridden by the weight of common opinion.

In research the field is dominated by the London and Manchester Business Schools, Warwick (industrial relations being mentioned as a particular strength - so much for Lord Boleff) and Lancaster (with the University of Manchester Institute of Science and Technology possibly also a member of this first division. Cases behind these four/five come Bath, Aston, Cranfield, Bradford, and Imperial College. Few surprises here, except possibly that some people would have put

Cranfield firmly in the top five and put Loughborough and Strathclyde in the top ten.

The teaching pecking order shows a greater spread but still a considerable consistency of opinion. Bath and Warwick are out ahead, followed by Lancaster, Bradford, UMIST, City, Edinburgh and Loughborough. However, an important qualification must be made: this ranking appears to be largely based on undergraduate courses with little attention being paid to postgraduate and post-experience work.

With this exception these rankings conform to the anecdotally accepted wisdom about the best places for business and management. A typical comment was: "As for the rankings, I can only repeat the accepted wisdom and say that among the postgraduate/post-experience schools judged by their teaching, Manchester Business School and London Business School stand preeminent with MBS a nose in front. Cranfield and Henley probably follow a little way behind. After that the conventional wisdom has difficulty with the rankings."

"On research, some schools have academics who have a high reputation in some fields and a not so high reputation in others. Reputations shift as people move around, get older, and so on, but images remain. I think in their different ways LBS and MBS stand out, but there is plenty of good work being done elsewhere."

The amount of money which business schools were able to attract for research and, in the case of undergraduate schools, the A level scores of their students both tended to confirm the subjective rankings. Cranfield (£3.2m), Henley (£1.5m), Lancaster (£1.2m), Aston (£900,000), UMIST (£732,000), all have good research reputations and attract a lot of money.

But the symmetry is not always exact: Stirling's total of £650,000 worth of external research money may suggest that our ranking underestimates its reputation. On the other hand, the Manchester Business School's total of just over half a million does not look particularly impressive, although a lot depends on a school's mix of expenditure. Sadly the London Business School did not answer the questionnaire.

Bath and Warwick reported high average A level scores among their students: 12.1 and 11.7 respectively, matching their first and second places in the teaching ranking. Loughborough was very close behind at 11.52, followed by UMIST (11.4) and Lancaster and Bradford (11.6). Again Stirling seems to have been the victim of a general low ranking but reported an average A level score of 14, just a fraction less than Bath.

Teaching rank

1. Bath	40	Also mentioned: Kent, Thames Valley, Swanssea, Salford, Plymouth Polytechnic, Sheffield City Polytechnic, East Anglia (5); Trent Polytechnic, Ulster Polytechnic, Middlesex Polytechnic, UWIST, Leeds Polytechnic, Imperial College, Sheffield (4); Polytechnic of Central London, Coventry Polytechnic, Birmingham, Ealing College of Higher Education, Leicester Polytechnic, Stirling, Polytechnic of North London (3); Portsmouth Polytechnic, Bristol Polytechnic, City of London Polytechnic (2); and Brighton Polytechnic, London School of Economics, Timberlake College of Higher Education (1).
2. Warwick	37	
3. Lancaster	25	
4. Bradford	21	
5. UMIST	18	
6. City	18	
7. Edinburgh	18	
8. Loughborough	15	
9. Manchester Business School	15	
10. London Business School	13	
11. Aston	13	
12. Strathclyde	11	
13. Cranfield	11	
14. Kingston Polytechnic	9	
15. Liverpool	8	
16. Cardiff	8	
17. Durham	6	

Research rank

1. London Business School	96	Also mentioned: Ashridge, UWIST, Leeds Polytechnic (5); London School of Economics, Trent Polytechnic (4); Bristol, Ulster Polytechnic, Durham (3); Swanssea, Manchester Centre, Middlesex Polytechnic (2); and Liverpool Polytechnic of Central London, Southampton, Paisley College of Technology, Plymouth Polytechnic (1).
2. Manchester Business School	84	
3. Warwick	64	
4. Lancaster	43	
5. UMIST	23	
6. Bath	23	
7. Aston	17	
8. Cranfield	17	
9. Bradford	17	
10. Imperial College	13	
11. Strathclyde	13	
12. Loughborough	11	

The Commonwealth Year Book in 1907 included a couple of footnotes to the effect that the 1,054 students at the University of Sydney the year before "included 142 females", and that Melbourne University's 853 students "included 233 females".

More than three quarters of a century later, some 43 per cent of the nation's 160,000 university students are women. So even though the proportion of female university students has markedly increased in that time, there is still a long way to go before there are as many women as men on university campuses.

This is particularly so at higher levels. Indeed, while females make up about 45 per cent of the students studying for their bachelor degrees, they only constitute 29 per cent of those taking higher degrees.

Moreover, the growth in the number of women studying for higher qualifications has failed to keep pace with that of the female undergraduate population. Whereas in the early 1950s, the difference between the proportion of female higher degree students and female bachelor degree students was 7 or 8 per cent, in the late 1960s it rose well above 10 per cent and throughout the 1970s remained steady at between 15 and 16 per cent.

According to D. S. Anderson and A. E. Vervoorn in their report, *Access to privilege: patterns of participation in Australian higher education* (ANU Press, 1983): "... the different participation rates for women in higher degrees and undergraduate degrees give support for the view that wherever you find a hierarchy in education, you will find women at the bottom of it". Certainly this is the case among higher degree students themselves and among university academics. For example, some 30 per cent of university students in Australia studying for their master's degrees are female, while of those taking a doctorate, fewer than a quarter are women.

The situation is worse for women on the staff of universities. Although females make up 43 per cent of academics at the lowest level of tutor or demonstrator, fewer than 17 per cent of total university full-time teaching and research staff are women.

At the level of lecturer, women make up only about one in five staff; at the professorial peak, only 2 per cent are female. The lower level positions in universities do not carry with them the benefits of tenure (or of superannuation and long-service leave) so the majority of female academics hold untenured positions.

Within university courses there are clear gender differences that highlight the sex stereotyped roles males and females perceive for themselves in this country. Women, for instance, dominate the humanities, music, the social and behavioural sciences, and education.

But of 13 different fields of study listed in the Anderson and Vervoorn report, females outnumbered males in

Second sex fights for first choice

WORLDWIDE

Geoff Maslen reports on bids to introduce equal opportunity in Australia

only four. In law, medicine, dentistry and the natural sciences, males were three and four times as numerous as females. In engineering, female students constituted only 5 per cent of the total.

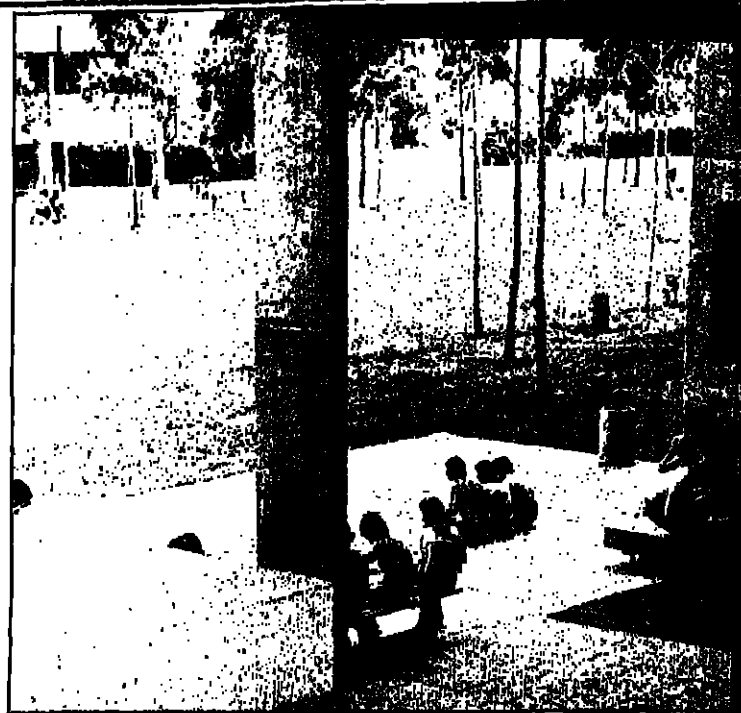
In Australian colleges of education, more than 48 per cent of undergraduate students are female. Today, college students are more numerous than their university counterparts, but again women in the colleges are concentrated in a few fields of study, notably education.

For whatever reasons - social reinforcement or innate leanings - it is certainly true that Australian boys and girls develop quite clear and different ideas about their future roles in life. Graeme Russell and Jacqui Smith, two behavioural scientists at Macquarie University, surveyed the occupational aspirations of a group of seven, ten and fifteen-year-old children.

They found the vast majority of both boys and girls aspired to jobs that either could be considered to be a stereotype of, or are dominated by, their own sex. Boys said they wanted to become tradesmen, members of the armed services and the police force, and members of male-dominated professions. Girls said they wanted to become nurses, teachers, and secretaries - especially seven and ten-year-olds - to marry and have children.

Russell and Smith found the sex differences were as evident in the responses of seven-year-olds as they were in those of the fifteen-year-olds.

Girls, of course, do not make decisions which affect their future. In a vacuum. They are influenced by peer group pressure, their own perceptions



Some 43 per cent of Australia's university students are women

of what is appropriate for girls, and by their parents.

In a study of more than 2,000 senior secondary school students in nearly 50 Victorian schools, a Monash University researcher found that the parents of many girls would rather see their daughters take an unskilled factory job than enter a technical or scientific professional field such as engineering. According to the study by Ms Suzanne Dillon, parents generally have views about the choice of future careers for their children that are both sex-stereotyped and 20 years out of date.

The federal minister for education and youth affairs, Senator Susan Ryan, is spearheading the attack on these attitudes and outcomes. In 1975, Susan Ryan was a member of a working party that produced a report on the education of girls called *Girls, School and Society*.

The working party found the now well-recognized set of disadvantages typical of the education of Australian girls: lack of access to a whole range of mathematical, scientific and technical courses and skills; inferior resources in girls' schools; failure of curriculum materials to acknowledge the contribution of women to society and the economy; lower expectations by parents and teachers; and - of particular importance - the failure of schools to develop the self-esteem of adolescent females.

In an address given to a graduation ceremony at Melbourne University last August, Senator Ryan referred to the working party's report and noted that the structure of the Australian teaching profession, especially the fact that decision-makers in schools were

almost overwhelmingly men, contributed to the failure of schools to prepare girls for the exercise of power and autonomy.

For her part, Senator Ryan has made it clear she will be taking legislative action to back up her equal opportunity exhortations, and will be directing more money towards encouraging girls to expand their career horizons.

The commonwealth has already ratified the United Nations convention on the elimination of all forms of discrimination against women. This formalizes the government's commitment to equality for women, Senator Ryan says. Ratification also means that the Australian government has undertaken to ensure that its laws, policies and programmes promote equality between the sexes.

The first step towards achieving this will be the passage of the Sex Discrimination Bill currently before Parliament. This Bill outlaws discrimination on the grounds of sex, marital status or pregnancy in a broad range of areas, including education and public and private employment.

It also provides for protection against sexual harassment in education employment. Legislation already exists along these lines in NSW, Victoria and South Australia.

In her lecture at Melbourne University, Senator Ryan said: "What the passage of the Commonwealth Bill will mean for tertiary institutions and universities in particular is not clear in every detail of administration. But what is clear is that in all of their employment practices, universities will no longer be able to discriminate

on the basis of sex, marital status or pregnancy."

More controversial, however, is Senator Ryan's plans to introduce affirmative action programmes in public and private employment. She said at Melbourne that it was not enough simply to outlaw existing discriminatory practices while leaving entrenched structural discrimination untouched.

Under the affirmative action legislation - to be outlined in a Green Paper next month - tertiary institutions, and possibly other groups and organizations reliant on the commonwealth for financial support - will be obliged by law to develop and submit to the Human Rights Commission an affirmative action staff management plan.

But Senator Ryan is also putting money where her rhetoric is. Girls are to be a major beneficiary of the government's A\$74m participation and equity programme - a modified version of the Fraser government's 1979 A\$100m transition from school to work scheme.

The new programme's intention is to reform and diversify the secondary curriculum, change teacher attitudes and skills, and change secondary school organization.

More specifically, the commonwealth has set aside A\$250,000 in 1984 for the Schools Commission to develop projects to improve the education of girls. The newly-resuscitated Curriculum Development Centre (a casualty of Fraser cuts) is to be charged with the job of developing non-sexist teaching material. Similarly, the A\$18m to be spent over the next three years on teacher education has a specific requirement that it provides equal access for girls.

The Schools Commission is now required to report on the impact of all its programmes on the education of girls and also has a working party on this subject. The A\$10m extra the commonwealth will give to tertiary institutions this year to enrol 3,000 more students is conditional on the institutions giving weight to increasing the participation of women and other disadvantaged groups.

Within higher education institutions themselves, there are at last signs of responsiveness to the social and political pressures for greater sexual equality. Equal opportunity offices have been created in several colleges and universities and committees appointed to supervise progress towards equal employment opportunities and monitor attendant practices.

Individual universities and the commonwealth are looking to provide adequate child-care facilities as part of equal employment policies.

So a start has been made and future Commonwealth Year Books are likely to reveal that women outnumber men on university campuses. But it will be many years yet before that will be the case in university staff rooms.

Cracking the code

Research can be a perilous business. An example. A man suddenly collapses to the floor of a station. Blood trickles from his mouth. After a few seconds a male passenger moves to help. Another passenger tries to pull the emergency cord but is restrained by a fellow "passenger", and at the next station he helps the "stricken" man to leave the train.

The episode was staged by American researchers investigating attitudes to public distress. Their published research in 1972 found that help is usually given (in 80 per cent of cases) by males, is more likely for medical than for alcoholic problems, and is more likely for less serious cases (the blood put people off).

The findings are interesting. But the episode immediately raises certain social ethical questions. Should psychologists create fake emergencies? Should anyone pretend to need help and create anxiety in others? Is it important to know about such altruistic behaviour? More broadly the questions could be: was the research the right thing to do? Was it beneficial for society? Were the researchers good professionals? Such questions should be legitimately asked by the researchers before, during and after the work, and by other observers - for example the participants, or journalists, or other social scientists.

One way of trying to ensure such research is carried out in an "ethically correct" manner has been through the establishment of ethical guidelines or codes of conduct. Almost every major American social science association, except those for economists, has developed a code of ethics, often amid much controversy. The problems are obvious: with new procedures, and new phenomena to be studied, always emerging, it is quite impossible to produce a fixed all-encompassing code. Moreover norms and values which underpin ethics also change over a period.

A number of British groups and professions also have codes. The British Sociological Society for example adopted a Statement on Ethical Principles in 1973, covering areas such as professional integrity, the safeguarding of subjects' interests, relations with colleagues and employers, and teaching which for example included rules against the exploitation of a student's work by a lecturer. The National Union of Journalists has a professional code of conduct, while the Market Research Society (MRS) representing more than 4,000 members drawn from advertising, manufacturing, academic and market research bodies, has just revised its elaborate professional code.

Now the Social Research Association, with some 500 members from government, local authority, higher education and research institutions, is in the process of adopting its own ethical code. But according to Ms Denise Lieveley, who heads the SRA

Paul Flather reports on a new set of ethical rules for social researchers

ethics subcommittee, and Professor Roger Jowell, a key figure on the committee, the code will be entirely novel avoiding the traditional pitfalls of most ethical codes - that they are ignored because they are unachievable and unenforceable.

Jowell, who is co-director of the independent Social and Community Planning Research (SCPR) unit, linked to the City University, originally helped draw up the code for the International Statistical Institute (ISI) which gave its provisional approval at a conference in Madrid last September. The code was adapted and given interim approval by the SRA at a conference in London last month.

The code is unusual in that it avoids literal or specific rules which might be imposed or applied in all circumstances and might in time lose relevance and credibility. The idea, as Jowell puts it, is to explain potential ethical and technical conflicts and create a framework within which the individual researcher can resolve his or her own moral dilemmas as they arise.

The two traditional models of ethical codes - the "aspirational code" with its lofty but unattainable ideals and the "regulatory code" with its unenforceable rules - are both rejected. Instead the SRA code draws to some extent on the 1971 code of the American Anthropological Association and the 1976 Market Research Society code, just revised, both of which offered members guidelines on matters that simply defied regulation.

"What we have tried to create is more an educational code which allows researchers to make their own uneasy compromises," says Lieveley who works at City University's Survey Methods Centre. In a detailed paper to the ISI conference Jowell argued this was the only way to make a code effective. It would have five main aims: to increase awareness on significant issues; to inform social researchers of conflicting interests; to facilitate discussion of desirable practices; to provide a framework within which researchers can make their own ethical decisions; and to allow flagrant examples of malpractice to be exposed.

In his paper Jowell was quite blunt about the real motives for many such codes, motives he wanted to avoid. It would be good to think social researchers are motivated by high ideals, but more usually it is born from selfish reasons to create a strong sense of collective identity and to deflect public and legal concern about the manipulation and use of data and the invasion of privacy, he argued. He quoted the example of the Hippocratic Oath which for 2,000 years has bolstered the public image of doctors.

This kind of view is confirmed by Mr Peter Clark, secretary-general of the

MRS, who said the main aims of the society's code were to maintain standards and reassure the public. "We really want to keep out the cowboys who pretend they are doing research while really trying to sell something." The code itself covers areas such as responsibility, confidentiality, professional responsibilities to fellow researchers and to the general public "maintaining public confidence in market research". Mr Clark could not himself think of a member who had been expelled although Mr Bob Worcester of the MORI polling firm was relegated from full to associate membership after a criticism of some MORI research.

Such difficulties in enforcing codes led Jowell to reject the traditional code in favour of a new style "educational" format. As he put it: "The new code consists of a set of principles that we hope are realistic and achievable goals. It will not boil down to set of truisms."

The real sanction on researchers will not so much be expulsion as peer review. Issues of concern will be raised for public debate with reference to the code which all members will be asked formally to read and agree.

The SRA interim statement on ethical issues in social research runs to 14 typed sheets without annotated bibliographies, and covers the obligations to researchers to society, to employers and funders, to colleagues, and to their subjects. In brief it states:

● To society: researchers should pursue objectivity, upholding their integrity without fear or favour, not misrepresenting their findings by commission or omission, and not engaging in methods designed to produce biased results. They should consider all conflicting interests for society at large and their subjects, and they should widen the scope of their work to produce the most benefit for the community.

● To funders and employers: researchers should clarify their obligations and relations at the start by reference to the code, by impartially assessing alternatives, by providing funds with alternative methods. They should not pre-empt findings, and should guard privileged information. ● To colleagues: researchers should not exaggerate the accuracy or power of their findings, but should review their methods for assessment and review by fellow researchers. They should discuss ethical principles, and collaborate with colleagues in other disciplines.

● To subjects: researchers should avoid undue intrusion, always due to obtain informed consent, give subjects the right to refuse to take part, even withdrawing data or discontinuing operations. They should protect their subjects from harmful effects of participation, take all reasonable care to prevent identification of subjects, and respect the sensitivity of public data such as medical records.

Each guideline is followed by a list of potential problems and a commentary suggesting possible avenues for troubled researchers. One interesting example is the area of informed consent. Serious problems can arise when methodological requirements collide with security informed consent, for example in observation studies when behaviour patterns are noted without a subject's consent. The code says a subject's "private space" must not be infringed at any time and acts designed to make observation difficult must be seen as tacit refusal of permission to observe even in the public domain.

Another example is that extreme deception is used in the research in the kind of covert observation used by US researchers investigating homosexual behaviour in public places. Again on informed consent the code discusses the rights of "proxies" sometimes used to collect data when the subjects' too ill, or too young, or too "difficult" to make observation difficult must be seen as tacit refusal of permission to observe even in the public domain.

The SRA will consider the code again for full adoption at its next annual general meeting at the end of the year, while the ISI will pass its final judgment, appropriately, at its 100th anniversary conference in 1985. If the code is approved as is likely and receives sufficient publicity the operations of British social researchers can only be improved. And even if it is only members - and even if it is only members - are expelled for breaching ethical rules - at least the code can be known as a public

Ernest Boyer



Young minds must not be abandoned in the wasteland

Because of declining birth rates, the number of 14-24-year-olds in the United States will drop 23 per cent by 1997. This means that fewer young people will be available to do the nation's work. The potential of every young adult must be fully developed and more, not less, education will be urgently required.

Further, the ethnic and racial composition of young America is changing. While the population as a whole is aging, the youth population among black and hispanic Americans remains large and will proportionately increase. Today, slightly more than one quarter of white Americans are under 18 years of age, but nearly one half of all hispanics and over one third of all blacks fall into this youth category.

Of special concern is the fact that black and hispanic young people are precisely those with whom most of our nation's colleges and schools have been least successful. In 1979, 80 per cent of white 19-year-olds in the US were high school graduates. However, that same year, 64 per cent of black hispanic 19-year-olds held high school diplomas.

If minority students continue to leave school at the current rate, 150,000 additional young people - the equivalent of 11 entering freshman classes at Ohio State University - will lose their opportunity for further education by 1990. An increasing proportion of our youth will be condemned to social and economic failure. To avoid such tragic human waste, the rising generation of Americans must be adequately educated for the world they will inherit.

For most of this century, the American system worked reasonably well for those students who attended. A secondary school education was considered adequate for all but a small number of professional pursuits. Recently, however, all this has changed. The base of the economy is shifting. Many old jobs have all but disappeared and new ones have emerged. Between 1950 and 1979, the proportion of professional and technical workers in the workforce increased from 9 to 16 per cent, and the proportion of managers and administrators grew from 9 to 11 per cent.

At the same time, the percentage of blue collar workers decreased from 37 to 33, while farm workers, as a proportion of the labour force, plummeted from 12 to 3 per cent. Only in one category - service workers - was there an increase in the jobs in the workforce for which post-high school education might not initially be required.

This trend toward more specialized work seems to be accelerating. Employment in the five principal occupations associated with the computer field grew from 765,000 in 1970 to 1,158,000 in 1978 - two and a half times the overall growth rate in the nation's work force.

As we look ahead, it seems likely that even 12 years of formal schooling - as a terminal programme - will be inadequate for most students. Gunnar Myrdal predicted more than a decade ago that by the year 2000: "Practically all American youth would... demand and obtain not only secondary but also college education of some kind." Myrdal's prediction is closer to realization today.

If this society desires higher intellectual and economic productivity, a larger stock of both non-human and human capital will be needed. There is

a growing conviction here that from now on almost all young people will at some time in their lives need some form of postsecondary school education if they are to remain economically productive and socially functional in a world whose tasks and tools are becoming increasingly complex.

There will of course continue to be a number of drudgery, dead-end jobs and technology will continue to make some work intellectually less demanding. The new technology may, in fact, be creating a two-tiered work force with job training requirements increasing for some workers while decreasing for others.

The computational skills once required of the bank teller or the department store clerk, for example, are rapidly being supplanted by scanners and computers. It is also true that there will be far more low-tech jobs than high-tech ones. For every new job produced by computer technology there will be five or six new jobs created in the service sector - secretarial positions, janitorial work and food supply personnel.

But when all of this has been acknowledged, the fact remains that more education and perhaps a different kind of education will be needed if a new generation of Americans is to become productively employed and find satisfaction in a world dominated by ever more complicated tools and ever more complicated social conditions.

It is important to remember that a society, particularly a democracy, depends on its people not merely as workers but as citizens, as participants in the social and political work of their communities. General education then, or education for self-development and citizenship is as important as education for jobs.

The tendency to ignore these realities is deeply alarming. It is sadly ironic that at a time when productivity is being so heavily stressed by our political leaders, the farm so often seems to mean simply the output of our factories, mines, forests and oil wells, as if such output can somehow be divorced from people.

The failure adequately to educate - at public expense - a new generation of students, would be a shocking denial of their rights as persons and a fatal undermining of the vital interests of the nation.

Here, then, are the challenges: America is challenged now to shore up and reaffirm a commitment that has of late appeared to weaken. That is, its commitment to access for all American youth to not only secondary education but also to appropriate levels of post-secondary education.

Also, America is challenged now to assure that the quality of education offered in schools and colleges is equal for all students. Higher learning, in particular, must redouble its efforts to meet more effectively the needs of those who have been inadequately served by education in the past. As black leaders remind us: "A mind is a terrible thing to waste."

Television revolution

China's need for specialists is being met by its Television University. Jane Marshall reports

Large-scale expansion of China's Television University is under way to boost the number of specialists the country urgently needs, and to help compensate for the millions of university graduates who never materialized because of the Cultural Revolution.

After the death of Mao Tse-tung and the removal from power of his supporters in 1976, the new leadership placed great emphasis on the importance of education for rebuilding the shattered economy and modernizing the country.

The authorities established a new education system, setting up key schools, from primary to university level to educate an elite. But resources for priorities were, and are scarce.

Higher education in China also lacks adequate numbers of qualified teachers. So in 1977 the Ministry of Education started investigating alternatives to the orthodox university system - itself requiring work after visual inspection during the Cultural Revolution, to teach as many students as possible while making the most of limited manpower and resources.

China's Television University consists of CRTVU, which is the central Peking-based organization, and 28 provincial and municipal universities.

CRTVU is responsible for curriculum, creation of courses, setting minimum standards and examinations, and producing programmes and support materials. The provincial television universities look after students' affairs, including enrolment and assessment, teaching facilities and local administration. They may also make their own television and radio programmes to suit local needs.

The chairman and vice chairman of CRTVU administration committee, which controls the budget, are the ministers of education and broadcasting. The Ministry of Education has responsibility for curriculum development and the distribution of printed support materials, and finances these materials and the teaching staff. The Ministry of Broadcasting is responsible for the production, transmission and finance of programmes.

There are three kinds of Television University student - full, part and spare time. Full and part timers must have a working record of over two years, and they include workers, school leavers, technicians, soldiers and government employees. CRTVU also intends to enrol unemployed

young people.

Entrance to a Television University course is through intensely competitive examination organized by the provincial university. In order to succeed, candidates need to score at least 80 per cent in all subjects, which include politics, Chinese, mathematics, physics, chemistry and English.

Full time students work for a full degree over three years, and their employers give them dispensation to study while they continue to receive full pay and medical and other social benefits. They are expected to go back to their work units when they graduate and on their return receive the higher wages due to graduates. In the spring of 1983, 360,366 students were full-time students, combining study with work, and may take time off to watch the university programmes which are usually shown in the mornings.

Full and part-time students also have several hours homework a day and attend local study centres one or more times a week. Altogether, the CRTVU and the local television universities employ 6,340 full time and 15,321 part-time teachers, who might be former engineers or come from regular colleges and secondary technical schools.

There is no official record of the number of spare time students, but estimates put them at between two and six million. They do not formally enrol or take time off work but tune in to television and radio to follow one

more courses. They can obtain support material from bookshops and the local television university, and they may take examinations and will receive certificates if they pass.

The first generation of 78,031 Television University students - those who started their courses when it opened in 1979 - graduated in July 1982.

With its planned expansion, CRTVU expects to triple its enrolment by 1985, which would mean the television universities teaching about 45 per cent of the total number of students in Chinese higher education.

A loan from the World Bank, signed at the end of 1983 and due to start now, will provide the means to buy a substantial amount of new technology, develop the study centres and train technicians, producers and directors, management staff and teachers.

CRTVU and nine of the 28 provincial television universities, which have been nominated for major developments, will use parts of the loan to build large production and transmission centres. The nine include: the Peking municipal TVU (which is separate from CRTVU), Shanghai, Canton, Nanjing, Xi'an and Chengdu. Other provincial TVUs which will benefit from minor developments include those in Hainan, Hohhot, Kunming, Lanzhou, Nanning and Zhengzhou.

When it began, the Television University offered only two three-year diploma programmes in engineering and electronics. By 1982, there were 17 courses including mechanical and electronic engineering, maths, physics, chemistry and English. Those who enrolled in 1982 had a choice of 30 courses centred around three more diploma programmes - maths, physics and Chinese.

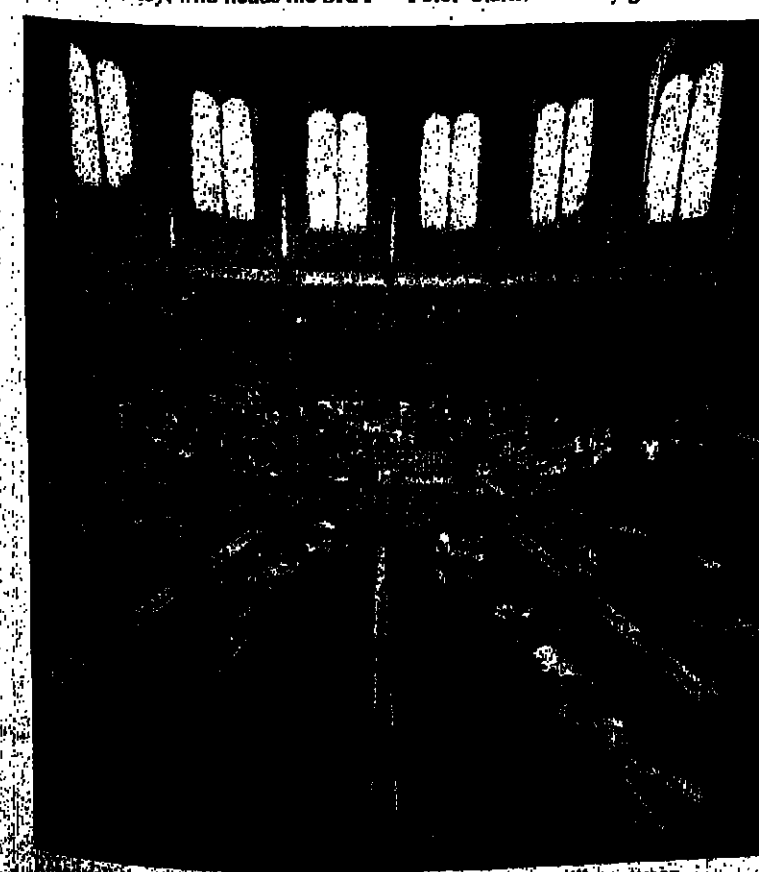
By the time the World Bank project ends, in three or four years time, CRTVU plans to have introduced 60 new courses in science and engineering, and 110 in social sciences and humanities. For 1984, new courses in law, economic management, and Japanese are planned; and CRTVU is devising a completely new English course.

The experiences of foreign experts who have been working as advisers within the Television University have revealed an innate reluctance of the Chinese to adopt new procedures.

But the problems - some caused by poor leadership and split responsibility, according to a diplomat working closely with the CRTVU - now seem to be gradually working themselves out, and livelier programmes are expected to result and be on the air by May.

Meanwhile, on the technical side China is planning to strengthen its present microwave relay system with a new satellite network for which it has set up 10 ground stations. And when a domestic satellite goes into orbit soon, it will enable Tibet to join the system.

There remains, however, the dearth of television sets in China, which at present possibly total only six million for a population of 1,000 million.



Big George on the telescreen

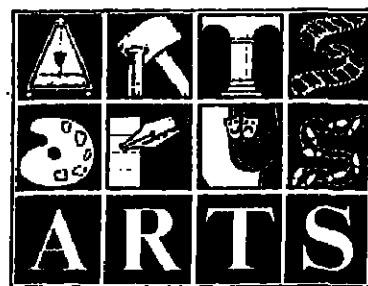
Not yet one month in That Year and already the familiar features of Big George seem to fill all channels on the television.

BBC got in first with Alan Plater's beautiful evocation of Orwell's convalescence on the island of Jura. Plater's chosen formula of an aging writer looking back over his life and works was conventional enough, even a cliché. That the film succeeded so well was partly due to Ronald Pickup's magnificent impersonation of Orwell. Not just a look-alike, he got right inside the skin and served of the man with his wheezing tubercular cough and croaking laugh. But the real brilliance of the film was the subtle understatement of Plater's approach. Resisting the temptation to lard his dialogue with insistent allusions, he used the domestic tensions between Orwell, his sister Avril, his friends and neighbours, to indicate Orwell's values and preoccupations.

This was a film which made its effects by tone and texture as much as by statement. The lonely, gaunt Herbriden landscape echoed Pickup's lonely, gaunt physiognomy. The spartan austerity of house and hillside were both context and metaphor for Orwell's angular honesty. Only an Orwell could have chosen to convalesce in such a barren spot that was less a pastoral arcadia than a penal solitude with hard labour. He spent his days digging peat, skinning rabbits and gutting fish, and his nights writing *Wineteen Eighty-Four*. The ambiguities of his character, with his deep respect for the traditional independence of the crofters, his reverence for old times and old ways, his integrity bordering on stubbornness and selfishness blending with compassion were eloquently established. And through it all ran the fear and intimidation of death - his wife Eileen's death before the film's beginning; his own death after its end; and the sunny boating trip around the island which could so nearly have ended in disaster in the whirlpool. The odd thing about death, Orwell remarked, was its ordinariness. *Orwell on Jura* succeeded in creating a haunting, tender imagery out of the ordinary events of life and death.

After such a masterpiece Nigel Williams's five-part *Arena* portrait of Orwell was likely to seem pedestrian, and it began disappointingly enough. Bernard Cribb was both consultant to, and part-representative of the series, and it seemed that Williams's basic strategy was to point a camera at Cribb's recent biography of Orwell. The trouble with this approach is that television, even when extended over four hours, can only present a tiny fraction of the material contained in a book like Cribb's, and any viewers familiar with the omission of many of the subtleties of analysis which make that biography so good. True viewers were given the anecdote from *Down and Out* when Orwell, dressed in vagabond clothes, is called "mate" for the first time in his life. They were not told that this anecdote is in fact borrowed from Jack London's *People of the Abyss*, as Cribb's biography points out.

Generally the first episode emphasized Orwell's conventional middle-class origins, his early imperialism and instinctive fastidiousness. The interview with his tailor was one occasion when the speaking voice added a richness to the written word, and it was fascinating to hear that even during his *Down and Out* days, Orwell would



David Nokes on versions of Orwell

spend as much on his trousers as a working man's weekly wage. Looking back on his hated prep school Orwell observed that, apart from money, what was particularly prized there was "something called guts, which in reality meant the power to impose your will on others". Just a few years later, in Burma, Orwell remarked that no one among the Burmese "had the guts to raise a riot". Whether intentionally or not, this juxtaposition neatly caught Orwell's place among his own class and caste. Despite his best efforts at understanding and compassion, Orwell's remarks on the Burmese, and on the waiters in Paris, have a tone of generalizing and disparaging and a fastidious curiosity which is quite at odds with what one takes to be the essence of Orwell - his emphasis upon individuals. In *Homage to Catalonia* he writes that a man running scared with his trousers down ceases to be "a fascist"; he becomes a fellow human being.

In all the outpourings on Orwell in the past few weeks, one point has been achieved: the status of an axiom: 1984 is 1948 backwards - post-war rationing and propaganda expanded to epic and nightmare proportions. Hence one of the basic techniques of the *Arena* films was a "before and after" effect, superimposing Orwell's words from the 1940s. Sometimes this was done to stress differences; the Hampstead bookshop had become a pizza parlour. More often it was used to assert similarities; particularly in *Wigan*, Nigel Williams not only retraced Orwell's footsteps in Wigan, but also repeated his sociological investigations, and came up with curiously similar findings. But there are real dangers with this "before and after" effect, and the montage of words and imagery seemed uncomfortably close to Big Brother's manipulation of history. A similar disquieting element in the films was the way in which the disembodied interviewing voice would move into and out of quotations without notice.

The best episode in the series was the one dealing with the Spanish Civil War. Orwell went out to the war vaguely hoping to fight for decency. He came back from it firmly committed to the struggle for democratic socialism. During the episode, viewers underwent an analogous process of political education. Early on, Frank Frankford was introduced, whose criticism of Orwell as a Fabian socialist, who could never get over the smell of the working class, seemed to carry both force and conviction. Later in the film however it emerged that this same Frank Frankford had falsified reports

of the struggles between communists and Trotskyites in Barcelona for the *Daily Worker*, and as he was seen wriggling unhappily out of his own political lies, our respect for Orwell's commitment to truth grew correspondingly.

As usual, *Animal Farm* was overrated and Orwell's literary journalism was sadly neglected, but a notable pleasure of these films was the interesting use of earlier documentaries on Orwell. In particular, Cyril Connolly and Malcolm Muggeridge kept popping up throughout the series like a comic chorus. There they were, strolling and lolling about the black and white Sussex countryside in 1965, chatting in amiably patrician tones about their former chum like a couple of overgrown prefects. "Too much politics," said Connolly sagely, and Muggeridge nodded. "Poor George. He tried so desperately to get inside the skins of working people. But of course, he never did."

By the time David Wheatley's *The Road to 1984* (Granada) appeared last night on Channel 4, that road had become rather muddy and well-trodden. Inevitably some of the scenes and dialogue, such as the description of the BBC as a cross between a girls' school and a lunatic asylum, were like the familiar milestones on a well-established route. However Wheatley attempted a grand style of dramatic simplification more usually seen in the cinema than on television. In *Wigan* as Orwell, who also doubled as Winston Smith in excerpts from *Nineteen Eighty-Four*, played the writer as a lone heroic individual, with a life-long mission to assert Liberty and Truth. He was a kind of young Winston, with a visionary intensity in his haunted eyes, and accompanied by swelling Romantic music. Narrative details, while accurate enough, were kept to a minimum. One simple scene on a bleak sea-shore, with a dapper white-suited Orwell declaring to his astonished parents "I am a writer" was all that we had as family background. There was, strangely, nothing of his school days at all. Instead the film focused on the hanging which Orwell ordered in Burma as the crucial trauma in his life, a point which was emphasized by frequent flashback shots. In Spain too we had action rather than words. The scenes in the Barcelona hotel with Orwell and Eileen escaping from the communists, with secret agents and the four-o'clock investigation, and came up with curiously similar findings. But there are real dangers with this "before and after" effect, and the montage of words and imagery seemed uncomfortably close to Big Brother's manipulation of history. A similar disquieting element in the films was the way in which the disembodied interviewing voice would move into and out of quotations without notice.

The best episode in the series was the one dealing with the Spanish Civil War. Orwell went out to the war vaguely hoping to fight for decency. He came back from it firmly committed to the struggle for democratic socialism. During the episode, viewers underwent an analogous process of political education. Early on, Frank Frankford was introduced, whose criticism of Orwell as a Fabian socialist, who could never get over the smell of the working class, seemed to carry both force and conviction. Later in the film however it emerged that this same Frank Frankford had falsified reports

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An all-day screening of Alan Bleasdale's *Boys from the Blackstuff* takes place tomorrow at the National Film Theatre in London. The five parts of the series will be screened together with two related plays *The Black Staff* (1978) and *The Music Market* (1981), and both writer and producer of the series will be present. The BFI has compiled a dossier about the series which provides excellent insights into production matters (explaining the significance, for example, of the use of light-weight video cameras for most of the shooting) and also into the phenomenal impact the series had on audiences. There seems to have been little statistical research into actual audience figures, but when response ranges from the Kop at Anfield chanting Yasser Hughes's "Gizza job, I can do that" to Jonathan Miller comparing the series with *Ulysses* it is clear that it made a significantly wide impression. The dossier, edited by Richard Patterson, is available from BFI Publications at £3.00 plus 50p postage.

So long, Luis

In the south west of the United States, there is a weekly radio programme which broadcasts all the local deaths. It has become such a regular item that all solemnity has gone out of it: someone just reads out the names. Paradoxically, though, this invests the whole thing, slotted in among radio ads for second-hand spin dryers, with a kind of ritual quality. It is, one feels, just the kind of content in which Luis Buñuel would have liked his death to be announced. "In Four Corners, New Mexico, Linda Mae Johnson has a twin but only a thirty-nine ninety-five, call her now. And in Mexico - I guess that's old Mexico - film director Luis Buñuel just died at the age of 83: so long, Luis."

This February will see a flurry of Buñueliana. His autobiography, *My Last Breath*, is being published next week, a couple of years after his French edition. And the National Film Theatre is running a virtually complete retrospective of all his films. It's all rather apt, really, because February is the month when most people die (though Buñuel, perverse to the last, died in the middle of summer). His entire working life - indeed, on the basis of the autobiography, his entire life - showed an obsession with death. He spent the summers of his youth in the village of Calanda and it was there, as he wrote, that he had his first encounter

with death which, along with profound religious faith and the awakening of sexuality, constituted the dominating forces of my adolescence.

The connexion between sex and death runs through all his films, from *Archibaldo de la Cruz's* sublimated murder-by-melting of a wax dummy, via Don Jose trying on his dead wife's wedding shoes in *Viridiana*, to Catherine Deneuve in *Belle de Jour* playing dead for the erotic delectation of an aristocrat. Buñuel's reputation is as a surrealist filmmaker. But surrealism died as a movement in the early 1930s. Buñuel held on: there was something in his very Spanish make-up which responded to it and adopted its iconography - its dream language, its mixing of sex and religion, faith and fetishism. It is a fascination which can only have been intensified by the years in Mexico, where the "Day of the Dead" is a holiday and children eat chocolate skulls.

In a medium which has done more than any other to trivialize death, Buñuel produced an oeuvre which restored it to its proper place: at the heart of life.

Nick Roddick

"My Last Breath" is published next Thursday by Jonathan Cape at £8.95.

The transistor, key to so many modern technologies, is 35 years old. PAUL HOCH looks back at its perfection in the American Bell laboratories and examines how the Russians lost out in the race to develop one of the most important modern scientific components.

Held in check by years of tyranny

In his opus *The Social Function of Science*, the Marxist crystallographer J. D. Bernal rightly pointed out that in 1934 the Soviet Union was spending eight times the amount on science as a nation of its national income as Britain, and roughly 50 per cent more in these terms than America. The USSR's provision of buildings and laboratories in the physical sciences was regarded with envy by scientists throughout the world. Moreover, the country was clearly making great strides, especially in the physics of metals (and of solids generally) which were later to prove the basis for the development of the transistor and solid state electronics. Yet by the late 1940s Soviet research in applied solid state technology was lagging way behind that in America, and was to remain comparatively backward for decades to come.

An important factor in this growing gap was undoubtedly America's much more substantial industrial base which, combined with its military mobilization and comparative immunity to wartime devastation, was to power a rapid increase in the size and scale of American science from the early 1940s. Also crucial to the perfection of the transistor at Bell Labs in New York in the early post-war period was the very close interaction between the most advanced theoretical knowledge of the quantum theory of solids - as incarnated in the Princeton and Harvard-educated John Bardeen and the Massachusetts Institute of Technology-trained William Shockley - with the most advanced technological knowledge embodied in Walter Brattain. In the background was the tremendous knowledge of the properties of early 1940s and in the case of post-war semiconductors which would go into the transistor, which had been gained when they were considered for use as radar detectors during the war at Bell and other leading American contractors with whom it interacted, especially the wartime Radiation Laboratory at MIT.

The question might then arise: why didn't such a synthesis of advanced theory and technological practice exist in the USSR? For example, the whole ground floor of the Institute for Physical Problems in Moscow is a military facility, off-bounds even to most of the Institute's own staff, which does not perhaps encourage the most favourable attitudes toward applied work among those so excluded.

Given the fact that USSR research on electronics and semiconductors in the 1930s especially at the Physico-Technical Institute in Leningrad was among the most advanced in the

UK, at Cambridge, by Alan H. Wilson. On the other hand, at a recent meeting of solid state physicists and historians at the Royal Society, Wilson pointed out that at the time his work was done, the UK electrical industry showed almost no interest.

Because of the smaller scale and less centralized organization of the UK electrical industry at that time, it rarely attracted postgraduate-trained physicists of the calibre of Bardeen or Shockley. Related to this, the distance between the most prestigious university science and the applied technology of British industry has been particularly great compared to the situation in the United States. The number of industrial researchers who have been members of the Royal Society would be minute compared to those in the US Academy of Arts and Sciences.

A synthesis of theory and practice

The USSR in 1917 also inherited a somewhat aristocratically oriented science, centred around their version of the Royal Society - the Academy of Sciences - which was comparatively remote and uninterested in applied technology. Nevertheless, the Soviets have tried over the past three generations, with varying degrees of success, to bring advanced science and technology into closer relation to achieve the synthesis of theory and practice commended by Marxist doctrine. Such efforts were particularly pronounced in the case of wartime research in the early 1940s and in the case of post-war research to catch up with the successful Anglo-American development of an atomic bomb. On the other hand, ideological campaigns akin to that of the Lysenko movement in biology have been (and remain) fairly unpopular with Soviet physicists, and at its worst the synthesis of theory and practice has meant simply the introduction of military projects into the most advanced Soviet research institutes. For example, the whole ground floor of the Institute for Physical Problems in Moscow is a military facility, off-bounds even to most of the Institute's own staff, which does not perhaps encourage the most favourable attitudes toward applied work among those so excluded.

Given the fact that USSR research on electronics and semiconductors in the 1930s especially at the Physico-Technical Institute in Leningrad was among the most advanced in the



Abram and Anne Ioffe. Ioffe was a victim of the post-war disputes.

world, it seems surprising that Soviet research in these areas only a few years later, in the late 1940s, had failed to keep pace; and did not come anywhere near to developing a transistor. Undoubtedly a major setback was the wartime devastation of Western Russia, which especially in Leningrad was nearly total, and was also related to a serious post-war shortage of experimental equipment (which in fact continued well into the 1950s). Almost equally important was the post-war diversion of a good many of the most accomplished solid state researchers into the atomic bomb effort, and which was also accompanied by serious battles with the directors and staffs of the main Soviet physics research institutes in Leningrad and Moscow. Nor can one ignore the serious damage done to Soviet physics even in the late 1930s by the earlier Stalinist purges, the arrests (and even executions) of key Soviet scientists including laboratory and institute directors, and the expulsions (or non-admittance to the USSR) of a number of key foreign (especially refugee) physicists.

The post-war disputes between the head of the bomb programme, state security chief Beria, and the main Soviet research institutes about the balance of fundamental and military research, especially on the bomb, was to be especially damaging. It was in effect also a dispute about military and state security control over academic research, and resulted in the expulsion of the leading Soviet semiconductor physicist, Abram F. Ioffe, from his post as director of the Leningrad Physico-Technical Institute. Another key Soviet institute director "retired" to his dacha in this period was Beria's Peter L. Kapitza, the founder and head of the prestigious Institute for Physical Problems in Moscow, who was replaced by the present head of the Academy of Sciences, A. F. Aleksandrov. In a 1980 article in *Uspekhi Fizicheskikh Nauk* marking the 100th anniversary of Ioffe's birth, Aleksandrov recalled that in the early post-war period: "The most urgent task was to mobilize all effort to the solution of the atomic problem. Semiconductor work took second place at this stage and A. F. Ioffe was removed from the directorship of his institute."

Aleksandrov suggests that when "the new director is far removed from the traditions of the collective the creative organism developed over decades can easily be damaged, and this process did, in fact, begin at the Physico-Technical Institute." The situation was somewhat better at the Moscow institute, where Aleksandrov was put in command, but was still far from ideal. Although in the mid-1950s Ioffe was eventually allowed to initiate the separate Institute of Semiconductors in Leningrad, in the meantime Soviet work in this vital area had been badly damaged. The situation at the Leningrad PTI, Aleksandrov recalls, only returned to normal in 1957 with the appointment of Ioffe's pupil B. P. Konstantinov as director.

Leading the Soviet atomic effort

It should be remembered that the main scientists called upon to lead the post-war Soviet atomic effort, Igor V. Kurchatov and Aleksandrov, had in the early 1930s worked closely with Ioffe at Leningrad and were at that point perhaps the leading Soviet figures investigating dielectrics and ferro-electrics. Of the leading Soviet theorists to survive the war, those encouraged to go into nuclear work included Igor Tamm, I. K. Kikoin and D. I. Blokhintsev. Of these, only Kikoin, in the late 1950s, was to return to full-time work on the physics of solids.

Of course, back in the 1930s, of the most outstanding theorists at the Leningrad PTI, George Gamov had fled the Soviet Union in 1934; M. P.

Hronstein (who had also done important work on semiconductors) was arrested, and executed, in the purges of the late 1930s; and also arrested and held in custody for several years was the elder statesman of Leningrad mathematical physics, Yuri A. Krutkov. Imprisoned for a year in 1937/38 as an enemy of the people was the most outstanding Soviet quantum theorist, Lev D. Landau; and imprisoned for shorter periods were people of the stature of the director of the Khar'kov PTI, Ivan Obreimov, and the Leningrad relativity theorist Vladimir A. Fock. The story is told about the latter that, when accused of having attended a party at which people spoke against Stalin and not protesting, he simply replied: "I'm deaf. I didn't hear it." Landau was released after Kapitza went directly to the Presidium to hand in his own resignation. The outstanding Khar'kov low temperature experimenter Lev Shubnikov, who also made important contributions to the development of the technique of zone refining of solid crystals (also crucial to solid state electronics), was imprisoned for many years and in fact died while still in custody. The Soviet relativity theorist Yuri Rumer emerged from imprisonment only many years later.

In his 1952 book *Conspiracy of Silence*, the Austrian physicist Alex Weissberg described the situation at the Khar'kov PTI, where he was working in 1938: "The head of the laboratory for crystallography, Obreimov, is under arrest, and so is the head of the low temperature laboratory, Shubnikov. The head of the second low temperature laboratory, [Martin] Ruhemann, has been deported. The head of the laboratory for atom-splitting, [A. I.] Leipunsky is under arrest; and so is the head of the Roentgen department, Gorsky; the head for theoretical physics, Landau, and the head of the experimental low temperature station, myself."

As far as he knew, only one of the eight laboratory directors at what was the USSR's second most important PTI was still at work. If the Nazis had set out to sabotage that part of Soviet science most relevant for technology, they could scarcely have done it so effectively.

In summary, the Soviet post-war effort in solid state technology which could have led up to the transistor was, in fact, stymied both by the distance that still remained between the most prestigious university science and applied technology, the wartime devastation and shortages of experimental equipment, disputes about military control over academic physics, diversion of talent into the atom bomb effort, and by the "arrests" of the leading Soviet physicists of the late 1930s. The Soviets have never caught up, and even today the legacy of the 1930s and 1940s still exerts a continuing negative influence.

The author is a senior fellow in social and technology policy at the University of Aston. This article was originally presented at a symposium on the British Association session on Science in Europe, held at Sussex University, August 23, 1983.

Scrutinizing the accounts

accounts show relatively little uniformity of overall practice with the consequence that comparisons between universities are hard to make and representative figures for the universities as a whole are also subject to doubts. The complexities of what may or may not be included in the published accounts considerably diminishes their validity for intra-university or inter-sectoral comparisons.

There was broad agreement that the relativities between medicine/science/arts were of the correct order; but the large differences between the two sides of the binary line need to be viewed more cautiously due to the very different conventions used. For example, research costs - which are much heavier in universities - are left in the ways in which the equipment grant is dealt with differ in the two sectors, the irrelevant liability for VAT occurs only in the university sector, and gross differences are assumed for superannuation costs in the two sectors even though benefits are virtually identical. Again the two sectors have very different mixtures of types of students making appropriations difficult, there is little uniformity on converting part-time students to full-time equivalents, and finally general institutional overheads have been allocated on student numbers rather than on departmental spending patterns.

Thus while the exercise has thrown up a number of points of principle, it does not give a definitive answer to the difficult question of what the costs per student place are. If indeed a cost can be defined, University published

would not detrimentally affect the recurrent grant that they would otherwise received. Yet there seems to be insufficient recognition at official level that this change of position has some direct consequences for the financial monitoring of institutions.

The funds generated from outside can be of two types. The first type is where money is given unconditionally with no strings attached, like the permanent funding of a chair in a subject the university wishes to sustain. However, the amount of such money available is extremely limited and most of it is given for only a relatively short period, e.g. a chair in a new subject for five years. The second type is where the funds are generated for a specific purpose which require direct servicing. Examples are continuing education courses, or research contracts. This second type of external funding does not necessarily require the resource base for normal teaching activities since the funds generated are effectively fees for services rendered.

Large scale accretions of non-governmental cash, that would markedly improve the teaching base on a permanent basis, are only likely to arise through higher tuition fees for undergraduates and/or postgraduates. Such fees must not effectively be paid for from the public purse in one guise or another. Incidentally, overseas fees themselves form a category of non-governmental funds employed to run a university and it is necessary to decide in the long run how the very sizeable and rising income received from this source should be handled in the accounts on a

meaningful basis. For example, these students could be treated as marginal income and costed accordingly or they could attract full overheads. Since the latter is virtually impossible in a world market situation, it raises the question as to whether the Government would underwrite shortfalls in numbers by increasing their subventions for home students.

Despite these difficulties, universities will naturally seek to attract monies for all possible sources, if only to maintain their width of activity and to keep the university as viable as possible. The accounts prepared by universities must clearly be drawn up in a form that enables the overall views to which government funds are put to be delineated in such a way that auditors and Parliament are satisfied. But, with a greater variety of sources of funds, it must be accepted that different universities may use their total available funds in different ways, so that detailed breakdowns can be relatively meaningless. Provision of the total government contribution does not exceed what might be regarded as an acceptable cost per student place. Its detailed allocation is an internal matter that is more appropriately dealt at an institutional level, bearing in mind the ways in which other externally generated funds are being deployed within the university. Only in this way can full encouragement be given to universities to achieve a greater degree of financial autonomy as possible. What is then important is to decide on the bases upon which the government contribution is to be calculated.

Peter Moore

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T.H.E.S.

FORTHCOMING SPECIAL BOOK NUMBERS

European Studies	Feb 3
Social Administration	Feb 10
Environmental Sciences	Feb 17
American Studies	Feb 24

Events

Concerts

Sunday: Recital Room, Brunel University: David Robson (harpichord); J. S. Bach: Goldberg Variations.
January 24: Turner Street Hall, University of Southampton, Martin Best: A solo recital of medieval songs and lute, entitled *The Troubadour's World*.
January 24: University of Kent: The English Concert, directed by Trevor Pinnock: J. S. Bach: *Brandenburg*.
January 25: North Staffordshire Poly: Paco Peña plays at St John's Church Centre, Hanley.
January 25: University of York: The Butler Ensemble: Works by Cornelius Cardew and Hans Eisler.
January 26: Royal College of Music: Sir Alexander Gibson, conductor: Stravinsky: *Capriccio Horn*; Mozart: *Requiem*.
January 27: Great Hall, Goldsmiths College: London NCOs Orchestra: Benjamin Britten: *War Requiem*.

Other events

Tonight and tomorrow, Clarendon Studio, University of Kent, Clarendon Theatre Company: *In the Heart of the Matter*.
January 28: Clarendon Theatre, University of Manchester: *When the Wind Blows* by Raymond Briggs.
January 28 to January 28, Drama Centre, University of Strathclyde, John McGrath's play *Events While Guarding the Before Gun*.
January 23: University of Surrey: *Shrewd moves*, by Virginia Taylor. Contemporary dance.
January 24 and 25: Alagar Arts Centre, Crewe and Alagar College of Higher Education. Contemporary Dance Theatre.
January 25: Triangle Arts Centre, University of Aston. *One Man's War*: film by Edgardo Cozarinsky which combines newscasts from Vichy France with the wartime journals of Ernst Junger, stationed in Paris.
January 30: University of Surrey: Talk by Professor Bernard Cribb on George Orwell.
February 2 to 4: Commonwealth Institute, London: *Jagan*, an Indian movie from the City of London International Film Festival.
February 9 to 11: Theatre, University of Essex: *1982 Company*, in Dario Fo's *Maestro Buffo*.

The author holds the Herbert Lehmann chair of theoretical physics at the Weizmann Institute, Rehovot, Israel, where a version of this article was first published in the house journal *Beitout*.

Creating an alternative model

In an article in *The Times* on December 23 Professor Alan Wilson argued the need for greater creativity in all branches of higher education. He referred to the distinction between convergent and divergent thinking, associating the two loosely with rigour and creativity respectively. As convergent thinking was well established in most disciplines, what was needed was a complementary training in divergent thinking.

Now, in response to Alan Wilson, JOHN DUBBEY casts doubt on the convergent/divergent model. However much creativity merits encouragement, is it possible to parcel it off in this way?

Creativity has never been identified as a type of mental faculty capable of development and training, but is recognized invariably in terms of its end-product. This will differ according to the contextual discipline, so that creativity acknowledged in one sphere may be quite different to that recognized in another. An individual creation is so embedded in its subject material that it is unlikely that cognitive techniques for developing creativity, such as divergent or lateral thinking, can be of much use.

Second, in the absence of an acceptable definition, some workers in the field have tended to identify the concept with divergent thinking, even using the terms interchangeably in some cases. It is therefore not surprising that researchers who take this view find good correlations between the two concepts. In cases where scores from divergent tests are measured against more subjective opinions of creativity, the correlations are far from convincing.

Third, it is doubtful if the polarity between convergence and divergence is as real as the terms suggest. Accepting that convergence is the operation within a set of rules towards a single answer, while divergence searches for alternatives, sometimes attempting to solve a problem by reformulation, it is apparent that a divergent methodology will greatly help to solve a convergent problem and sound convergent thinking is a major element of a divergent solution. The results of convergence or divergence tests cannot unambiguously separate the two.

There are other approaches to the question of creativity. G. Wallas has described the creative process in terms of four essential stages, that of preparation, incubation, illumination and verification, while P. W. Jackson and A. B. Messick have distinguished features of a creative work as novelty, appropriateness, transformation and condensation.

The hint given in these more descriptive approaches that creativity is in some way a fusion of cognitive with non-cognitive processes is made much more explicit in the work of the Synectics and Silvano Arieti. For the former, W. J. J. Gordon has asserted that in the creative process, the emotional component is more important than the intellectual, and it is these emotional, irrational elements which can and must be understood in order to improve the creative output.

Arieti's theory uses what he calls the "primary process" as defined by Freud, consisting of the set of ancient, obsolete and primitive mental

mechanisms relegated to the recesses of the psyche which prevail in dreams and some neuroses, in contrast to the secondary process which is the mode of functioning of the conscious mind, using common logic. It is when an appropriate matching of the primary forms with secondary mechanisms takes place that innovations occur. It is this tertiary process that is capable of blending the worlds of mind and matter, rational and irrational to obtain the magic synthesis from which the new, the unexpected and the desirable emerges.

This association of rational with the irrational clearly moves us into uncharted territory, but it would be helpful to follow through the consequences with respect to a particular field of study, that of pure mathematics, the most "convergent" of all disciplines. Very little evidence of creativity is apparent from the end-products, the textbooks and publications. Here the logic flows inexorably and faultlessly from one premise to another until the theorem is proved, the result established. Seldom do we find evidence of that irrationality, the primordial process of the mind or the churning over in the unconscious which we would expect in creative development.

The apparent non-existence of these phenomena is, however, due much more to our convention that the explicit rendering of a mathematical solution relates almost exclusively to the content of justification and hardly ever to that of discovery. Fortunately the literature contains one notable exception, that of Henri Poincaré.

Poincaré's essay on mathematical creation, first published in *Science et Methode* (1908), gives a description of his discovery of Fuchsian functions. He relates that, after intensive but fruitless sessions attempting to put various combinations of ideas together, the vital insight came to him after leaving the problem alone and in the most unexpected circumstances. The major discovery, that the transformations he had used to define Fuchsian functions were identical with those of non-Euclidean geometry, came to him while actually stepping onto a bus. Then, walking along a bench a few days later and thinking of something quite different, the idea came to him that arithmetic transformations of indeterminate ternary quadratic forms were also identical. From these two inspirations, the theory develops in orthodox manner.

Poincaré's explanation is of considerable interest. He wonders why it is that among the multitudinous products of unconscious activity, only a few pass the threshold of consciousness, while



the majority remain below. His answer is that only those combinations emerge which pass the test of emotional, aesthetic sensibility. "Now what are the mathematician's criteria to which we attribute this character of beauty and elegance, and which are capable of developing in us a sort of aesthetic emotion? They are those whose elements are harmoniously disposed so that mind without effort can embrace their totality while realizing the details."

Poincaré's experience has undoubtedly been repeated not only among mathematicians but in many other areas, where a sudden insight has illuminated a problem during a neutral period after intense work. His attractive explanation is one way in which the match between primary and secondary processes may be secured and his success encourages imitation. The need to cultivate creative methods in mathematical thinking is, I believe, of major importance.

Creativity in mathematics is needed as an antidote to the emphasis placed on deductive reasoning. The human mind is at its most effective in making logical inferences, and man is increasingly capable of building machines to do the more complex reasoning. It could be that a new generation of computers will absorb most forms of mathematical analysis, as calculators have already done for arithmetic. The need for human skill to supply deductive reasoning will become increasingly redundant, and the major function of the mind will be to develop that insight which machines cannot supply.

Following the work of Popper on falsifiability, Lakatos has demonstrated that mathematics progresses through the successive attempts to refute by counter-example and hypothetical conjecture. He emphasizes the use of imaginative conjectures and refutations as being as necessary for mathematical development as deductive reasoning.

It is in the nature of maths to be continuously recreative itself, to take what is already existing and transform it in unpredictable ways. The increasing sphere of applications of mathematics continually requires

the imaginative ability to explore, model and interpret open-ended problems.

We need to encourage mathematical modelling in a diversity of applications, and in the presentation of formal material, emphasize the beauty and harmony, the generality and simplicity of mathematics. More use should be made of the history of mathematics in order to see the development of concepts and the processes of creation in great mathematicians of the past. Students should be encouraged to talk and write about mathematics and to raise their own conjectures and refutations.

More boldly, and generalizing to other disciplines, I would suggest the following exercises proposed by Arieti as a means to foster creativity, always of course within a strong subject contextual basis: looseness the inner self removed from all distractions; inactivity, taking time off to do nothing, avoiding routine work; day-dreaming, allowing the mind to stray constructively from the usual paths; free-thinking, being in a state of readiness to grasp similarities; gullibility, a willingness to rule out criticism and suspend judgment; remembrance, the inner replaying of past traumatic conflicts in order to transform them into creativity; alertness and discipline.

This may be the better way to improve the chance of obtaining a Poincaré-type experience. It could be that as lectures rightly disappear as a mode of teaching, the lecturer will retain a role not only as trainer/coach in resource-based learning material but also as director of such non-cognitive experiences. While such experiences defy normal educational orthodoxy they have their counterpart as well-established spiritual exercises, and this association reminds us of the ultimate motive that, when in the Genesis account man is made in the image of God, the only divine characteristic mentioned is creativity. Man is created to be creative.

The author is dean of the faculty of engineering at the Polytechnic of the South Bank.

Too full of Christmas pud to try?

Too difficult? Too obvious to merit a stamp? Or just not the kind of thing readers of *The Times* wanted to be bothered with over Christmas? Whatever the reason, the Christmas quiz didn't loose a flood of entries. Sad to say, no prizewinners.

The intention was that each passage would have sufficient internal clues to prompt at least a guess: 1. came from Karl Popper's autobiographical *Endless Quest*, the story of his search for "standards of truth"; 2. the opening words of a Shakespearean play; 3. the opening words of a novel; 4. the opening words of a poem; 5. the opening words of a short story; 6. the opening words of a play; 7. the opening words of a film; 8. the opening words of a book; 9. the opening words of a letter; 10. the opening words of a speech; 11. the opening words of a song; 12. the opening words of a poem; 13. the opening words of a play; 14. the opening words of a film; 15. the opening words of a book; 16. the opening words of a letter; 17. the opening words of a speech; 18. the opening words of a song; 19. the opening words of a poem; 20. the opening words of a play; 21. the opening words of a film; 22. the opening words of a book; 23. the opening words of a letter; 24. the opening words of a speech; 25. the opening words of a song; 26. the opening words of a poem; 27. the opening words of a play; 28. the opening words of a film; 29. the opening words of a book; 30. the opening words of a letter; 31. the opening words of a speech; 32. the opening words of a song; 33. the opening words of a poem; 34. the opening words of a play; 35. the opening words of a film; 36. the opening words of a book; 37. the opening words of a letter; 38. the opening words of a speech; 39. the opening words of a song; 40. the opening words of a poem; 41. the opening words of a play; 42. the opening words of a film; 43. the opening words of a book; 44. the opening words of a letter; 45. the opening words of a speech; 46. the opening words of a song; 47. the opening words of a poem; 48. the opening words of a play; 49. the opening words of a film; 50. the opening words of a book; 51. the opening words of a letter; 52. the opening words of a speech; 53. the opening words of a song; 54. the opening words of a poem; 55. the opening words of a play; 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SAFETY

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BOOKS

A point of departure

Dilemmas of Liberal Democracies: studies in Fred Hirsch's Social Limits to Growth
edited by Adrian Ellis and Krishnan Kumar
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The ten papers in this collection are all responses to Fred Hirsch's famous book, *Social Limits to Growth*, though the editors admit that many of their contributors "treat Hirsch more as a point of departure, as supplying an agenda of questions and issues to be discussed in the light of their own particular interests", while others are "yet more oblique to Hirsch". The truth is that the links between these essays and Hirsch's book are sometimes rather manufactured.

Unfortunately many of the contributors take their lead from the least closely-argued part of *Social Limits to Growth* - Hirsch's claim that the market system works only because there is an unspoken social morality of trust, honesty and mutual restraint, and that this morality is a "depleting legacy" from the pre-industrial past. In other words, capitalism lacks the moral resources to perpetuate itself in the long run. Several of the contributors point to the sketchiness of Hirsch's discussion of pre-industrial society: what exactly was the content of traditional morality and what social forces lay behind it? They point also to the fact that economic individualism and the market system are much older than industrial capitalism: if - as Hirsch sometimes suggests - economic individualism is the force that corrodes traditional morality, that morality has survived a remarkably long time. And they remind the reader that Hirsch's brand of pessimism has a long intellectual history, going back at least to Adam Smith: things aren't what they used to be, and never were.

These are all good reasons for scepticism about Hirsch's thesis, but they do not refute it. Rather than exploring these issues in more detail, many of the contributors give in to the temptation to stray on to subjects that interest them more. Hirsch, they say, was at least right in seeing that liberal capitalism faces some kind of crisis of "declining moral legitimacy"; but his diagnosis was wrong. And then they go on to offer their own diagnoses - diagnoses that are at least as specula-

tive as Hirsch's own. John Hall argues, in direct opposition to Hirsch, that "the current crisis of liberal capitalist societies" (which exactly this means is the cessation of economic growth, John Gray seems to agree that we are in a state of crisis, but claims that this is the result of excessive political intervention in economic life; if there is a cure at all, it lies in constitutional constraints on government. Raymond Plant argues that we need - and are capable of achieving - an agreed theory of social justice.

The contributors who digress least are those who discuss Hirsch's idea of "positional goods". Hirsch argued that certain goods cannot be supplied in

increasing quantities as economic growth proceeds, and that in consequence economic growth is increasingly incapable of satisfying individuals' remaining wants. This thesis is examined in two carefully argued papers, one by Adrian Ellis and Anthony Heath and the other by Jonathan Gershuny. Both papers come down against Hirsch. Gershuny, in welcome contrast to most of the other contributors, supports his general argument with some concrete evidence. He looks at a particular example of a positional good, personal service. (However rich we all become, we cannot all have servants.) If Hirsch's thesis was true, the positional nature of personal service would have been a severe social

limit to growth after, say, the 1920s. In reality, Gershuny shows, technical change has allowed people to substitute capital for labour in the home: we cannot all have servants, but we can all have the domestic services provided by washing machines and freezers. None of the contributors is a mainstream economist. This seems a pity, since Hirsch - for all his breadth of interest - was at heart an economist. (The first sentence of *Social Limits to Growth* describes the book as "an economist's answer" to certain questions.) If Hirsch's arguments are correct, they call into question a good deal of conventional welfare economics - in particular, the usual Paretian defence of the market system. Economists are

trained to think of production and exchange as positive-sum games, with "gains from trade" for everyone; Hirsch tells us that the economic system is more like a zero-sum game. He may be wrong, but he presents a case that deserves to be answered by economists.

If it really is true that only sociologists and political scientists read the work of economist like Hirsch, it is a sad reflection on the state of economics.

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Mid-term report

The Reagan Presidency: an early assessment
edited by Fred I. Greenstein
Johns Hopkins University Press,
£15.75 and £6.75
ISBN 0 8018 3056 7 and 3057 5

The contributions of well-known and respected authors to this book are informative, cool and judicious, scrupulously giving credit wherever due. Their indictment, therefore, is all the more compelling.

They praise the Reagan administration for its careful choice of priorities which enabled it to get the executive branch to implement its main policies, the legislature to carry them and public opinion to accept them. Ronald Reagan - who has far more political and governmental experience than is usually recognized - has disproved the new conventional wisdom asserting the impotence of the modern presidency.

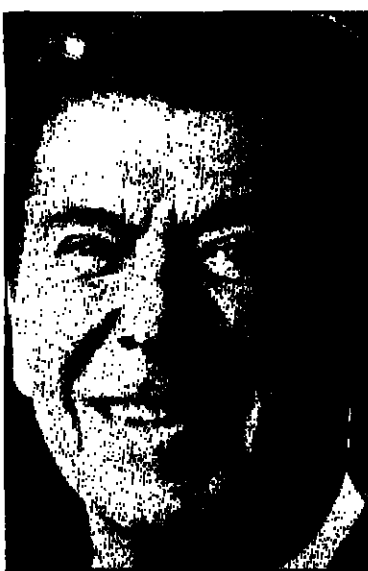
He has controlled the bureaucracy by giving the middle-level political appointments to true ideological believers, as he had done when Governor of California. The myth of his alleged mandate for his policies was brilliantly exploited by his legislative advisers to put through his economic programme early on. In foreign affairs, at first instead of the traditional coherent teamwork the "protracted, visible, in-fighting made the Carter administration look orderly"; but this President, unlike some of his predecessors, replaced the squabblers and improved the decision-making process. Unusually, the White House team worked harmoniously together and complemented their leader effectively.

On the substance of policy it is a very different story. Abroad, J. M. Destler

writes that repeated errors have required vast efforts to repair quite unnecessary damage, while simultaneously undermining precious domestic goodwill. "Truculent, caustic, confrontational" words from Washington? unseemly America's allies and fed anti-nuclear feeling in Europe. Efforts at reassurance collapsed when the pipeline decision "recalled all the worst stereotypes - simplistic, ideological, unilateral, ineffective and probably illegal" - and was taken blindly that "nobody of cabinet rank... knew what a mess they were making for themselves". Thus in foreign affairs Reagan has "kept the [conservative] faith, but at the cost of work."

In defence, the Budget Director has got current spending limited in return for authorizing long-term procurement funds; unspent appropriations reached \$110 billion by October 1982. The services were given both more money and more leeway in spending it, reversing Robert McNamara's reforms; Samuel Huntington clearly sees this administration spending more, wasting more, and achieving less. With defence expenditure unpopular again, and two thirds of all controllable funds in the entire budget going to the Pentagon, its share is very vulnerable - especially as the military will cherish their new weapon systems, so that the cuts will fall on "operations and maintenance" where they diminish the country's real defence preparedness.

In economic policy Reagan added to Carter's later strategy the massive tax cuts, which had no support among mainstream economists. For he spoke for a right-wing populist movement, distrustful of elite opinion, and would not renounce views which had become "articles of faith during the long march to the White House". As Greenstein notes, the President is far better at selling policies than at analysing them, and is "especially resistant to reconsidering policies in the areas closest to his most confident beliefs". But even his "self-confident optimism" about the



success of his mutually incompatible economic policies was dashed in the summer of 1982.

Recognizing that at the cost of high and prolonged unemployment a substantial recovery in the economy may occur, Hugh Heclo and Rudolph Penner see more difficult decisions looming in the near future, and an electorate still wedded to incompatible goals because no effort has been made to educate them.

Only Richard Nathan celebrates broad success in his field, domestic affairs. But it was an incomplete success, for articulate middle-class groups were able to prevent or reverse cuts, and lobbyists for the rich stopped David Stockman from ending their loopholes and subsidies. The one unequivocal triumph of the administration has thus been to reduce benefits and cut off medical insurance for the poor.

P. M. Williams

P. M. Williams is a fellow of Nuffield College, Oxford.

Fighting in the streets

Beating the Fascists? the German communists and political violence 1932-1933
by Eve Rosenhaft
Cambridge University Press, £24.00
ISBN 0 521 23638 X

In this new study of the Communist Party of Germany (KPD) in the Weimar Republic, Eve Rosenhaft shows how and why the party's capital and largest city became involved in brutal gang warfare with the Nazis and why, ultimately, such violent politics proved unsuccessful. But this book is about much more than this - for Rosenhaft sets her political analysis against illuminating discussions of fundamental changes which the German working class had experienced during the Weimar period, changing relationships with state authority, the changing nature of the working-class neighbourhood, and the advent of a new dimension to economic insecurity in the shape of long-term mass unemployment.

Making use of the court files of some 300 men arrested in connection with streetfighting in Berlin, Rosenhaft presents a fascinating picture of communist politics during the dying days of the Weimar Republic. She shows how the KPD was drawn into a violent struggle

of politics which involved defending working-class neighbourhoods (in the shape of "Bella" - most notorious slums), and how ambiguous and indeed contradictory the position of the KPD came to be. A party which had regarded itself as the political leadership of a revolutionary working class - defined by its relation to the means of production - found during the Depression that its following was largely unemployed, and concerned about issues outside the workplace, in the neighbourhoods.

Rosenhaft easily disposes of the image of the KPD as a monolith, in which a "Stalinized" party leadership supposedly was able to impose its policies upon a passive rank-and-file: questions concerning the use of political violence, and especially the attempt by the KPD leadership to restrict the violence from late 1931, aroused considerable opposition within the lower reaches of the party. (Workers were confronted daily with the police and the Nazis on the streets). The idea that it was the least established, the most rootless young proletarians who engaged in the violence also is questioned. Many of the most prominent practitioners were not the recent arrivals to particular neighbourhoods, and Rosenhaft (reiterates) the street-fighting took on the character of a defence of working-class neighbourhoods.

Rosenhaft explores the dilemma and ambiguities of the KPD's politics and its relationship with those it claimed to represent with an admirable critical understanding, and she shows how the peculiar brand of Communist politics which developed on the streets of Berlin can be seen as a consequence of a breakdown in patterns of social

organization. The communists, who, increasingly, organized the unemployed, may have profited in the short term from the effects of the depression. In the long term, however, the violent politics of defending working-class neighbourhoods (which were never so invulnerable to the Nazis or so solidly behind the KPD as the communists liked to think) brought the party out against not just the Nazi stormtroopers but also the police and the judicial system in a contest which ultimately they could not hope to win.

But to what extent was Berlin a special case? Was the strong sense of neighbourhood, which Rosenhaft regards as of fundamental importance in shaping communist politics, on the ground? Something peculiar to the KPD? To take up just one point: the bloody suppression by the Berlin police of the communist-led demonstrations on May 1, 1929 and the subsequent police attacks on working-class neighbourhoods (attacks which cost many lives and which, as Rosenhaft points out, deeply affected the attitudes of those living in Berlin's communist strongholds) did not really have a parallel elsewhere.

This is one of the most stimulating books about modern Germany to have emerged in recent years. It deserves to be read, and re-read, by anyone with an interest in working-class life and working-class politics, political violence, the rise of Nazism and the defeat of the German left.

Richard Bessel

Richard Bessel is lecturer in history at the Open University.

The court and the country

Territory and Power in the United Kingdom: an interpretation
by Jim Bulpitt
Manchester University Press, £17.50
ISBN 0 7190 0937 5
The Fragmented State: the political geography of power
by Robert Paddison
Blackwell, £19.50 and £7.95
ISBN 0 631 19580 7 and 13087 X

Every regime has a centre and a periphery. The centre need not be in the middle. In the UK, for instance, it is in the bottom right-hand corner. But it is where both power and wealth are concentrated. The rest of the country is usually less of both, and may indeed only be part of the country by conquest or by recent treaty of long ago. Therefore in every regime we may expect to find a power struggle between a dominant centre and a sullenly resentful periphery.

For the last two decades, this paradigm has dominated the study of central-local relations in the UK and elsewhere. Now comes Jim Bulpitt, offering something subtly different in *Territory and Power in the United Kingdom*. For Bulpitt, the conflict is more social than geographical. The social and geographical peripheries overlap substantially, but they are not

the same: likewise the social and geographical centres. Those good old eighteenth-century terms, the court party and the country party, are the closest to what Bulpitt has in mind. At court, the elites who first met at Oxford meet again as they come in from the parties, the city, the administrative civil service, even the trade union research departments. Every so often an awkward deputisation from the country huddles at the door: maybe with snow on its boots, maybe from wild and woolly parts like 24 Old Queen Street, the home of the Association of Metropolitan Authorities.

Bulpitt's account of all this is vigorous, bad-tempered, allusive and elusive. He is good on some famous crises, such as the destruction of the Whig-Liberal coalition over Ireland in 1886. In 1886 the political parties abruptly crossed over, as the old court party (the Whigs) were shattered and the Conservatives came in from the country to represent not just the church and the squires, but imperialism and finance. Finance capital (Mr James Harcourt) linked with the Conservatives, the centre and traditional elites; industrial capital (Gladstone and Bouverie) linked with the Liberals, the provinces and nonconformity. It was a coalition of convenience, but it had the odd nod in their direction, but nothing of substance.

The dictionary format of the book allows the authors to cover an enormous amount of ground in a relatively short space, but that same format makes the book difficult to read through. As we are instructed in the preface, the alternative is to use the book for browsing. The reader's periphery, we are informed, is to skip. However, I read each entry and was glad that I did. The entries are beautifully written and I learned something new from a great many of them.

The Medawars regard words as everyday tools and they are no respecters of priorities and concise definitions. "If the word and the concept it stands for are found useful, they will stick; if not they will not". For example, the word "protoplasm" has meant many things in the past but now, after a period of well-defined usage, it is left to slip from everyday biological vocabulary - it has outlived its usefulness. Indeed, the authors' frustration with many philosophers of science leads them to suggest that a new word should be coined. The medical profession uses the word "iatrogenic" to describe disabilities that result from medical treatment. Apparently, a similar word is needed to describe "philosophical difficulties for which philosophers are themselves responsible". For example, there has been a continuing debate about whether we should refer to protozoa as single-celled or non-celled. Since nothing turns on the decision, the argument was not worth having in the first place.

Even if they are not concerned with definitions, the Medawars can be deplorable. To my mind, several of their entries achieve this status - behaviourism, reductionism and endocrine glands are examples. However, a deplorable style can mask questionable propositions. True, the authors were not to know that a method for identifying the subunit of Huntington's chorea would be forthcoming (*Nature*, November 17, 1983) while their book was in press; twice they argue that offspring of chimeras should not, themselves, have children. But it is surely misleading to state that heterosis (superior fitness of genetic heterozygotes) is the most important selective force maintaining genetic polymorphisms in populations when the number of known examples is less than five. My understanding of the current position is that the frequency-dependent selection is likely to be a far more potent factor.

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Iain McLean
Iain McLean is fellow and praetor in politics at University College, Oxford.

BOOKS

Biology watching

Aristotle to Zou: a philosophical dictionary of biology
by P. B. Medawar and J. S. Medawar
Weldonsfield & Nicolson, £15.00
ISBN 0 297 78297 5

There are at least three reasons for reading the collected letters and essays of distinguished scientists. The first is to gain insights into the personalities that motivated their scientific achievements. The second is to understand their methods of scientific inquiry, which may or may not equate with their professed philosophies of science. And the third is to gauge their views on contemporary issues. This book by Sir Peter and Jean Medawar will, to a large extent, alleviate the need to collect Sir Peter's papers at some later date.

Obviously, the Medawars' aim has been to produce a biological equivalent of Voltaire's *Philosophical Dictionary*. But, as the authors are at pains to point out, the final product is not a dictionary of biology. Instead it consists of about two hundred short essays on a series of topics that fascinate biologists and interest the lay world. These vignettes differ enormously in length, scientific content and wit. The authors are zoologists by both training and profession, and so botanical references are few and far between. Within zoology, they also focus on their mutual interests, which include immunology, genetics, evolution and comparative morphology. Ecologists will find the odd nod in their direction, but nothing of substance.

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son espouses his namesake's (D.S. Wilson's) group selectionist models in the very text to which we are referred.

The authors have been closely associated with many of the scientists whose work they describe. This usually leads to warm personal accounts of important developments in biological research. They have obviously written many anecdotes from memory, and their accounts often depend on impressions of people rather than on historical research. As an example, the story about J.B.S. Haldane offering, in the confines of a local pub, to lay down his life for eight cousins (and thereby inventing kin selection theory) is told yet again. The story may be true, but its validity has been hotly disputed by W.D. Hamilton. The important point for historians of science is that Haldane published the example in the Penguin new biology series in the 1950s, thus demonstrating without doubt that he reached this conclusion. The Medawars apparently had respect for Haldane but disliked R.A. Fisher and so, purely for reasons of personality, at one point in the book (the entry on genetic drift) Fisher's important contributions to population genetics seem to have been deliberately undervalued. Only by reading other sections of the book will the reader get any feel for Fisher's considerable intellect.

However, my misgivings about occasional points of detail are minor compared with the positive features of this book. The Medawars manage to present their readers, biologists or not, with a thoroughly incisive and level-headed treatment of how practising biological scientists think and what they think about.

Paul Harvey

Paul Harvey is lecturer in biological sciences at the University of Sussex.

Cancer atlas

Atlas of Cancer Mortality in England and Wales, 1968-1978
by M.J. Gardner, P.D. Winter, C.P. Taylor and E.D. Acheson
Wiley, £45.00 (£35.00 before March 1)
ISBN 0 471 90042 7

International differences in the frequency of cancer (together with changes in cancer rates among migrant groups) have helped to establish the view that most cancers are environmental in origin. In particular, certain geographic "hotspots" have been an important source of specific clues to causes of human cancer.

Denis Burkitt first delineated a tumour in children in tropical Africa with a distinct geographic distribution in terms of rainfall and altitude, a discovery that led to the identification of the probable cause, the previously undescribed Epstein-Barr virus. Insights into the role of diet in causing cancer of the oesophagus have come from work in a high-incidence area for this disease in northern Iran, and in another such area in Brittany where alcohol and tobacco played a leading role. A cancer atlas, therefore, should form a fruitful source of clues of cancer aetiology.

The past decade has seen the publication of cancer atlases for the United States, West Germany, China, Japan and now for England and Wales. These maps for the period 1968-78, however, are not the first for this country, for the late Dr Percy Stocks published a set for the years 1921-30 before World War II, although they received little publicity, being buried in the annual reports of the British Empire Cancer Campaign. The new atlas is the most comprehensive, small-scale geographic study of cancer mortality in this country, and the first in colour, showing in 69 maps details of no less than 37 different types of cancer. For the 14 commoner cancers, there are small-scale maps covering the 1,366 (pre-1974) local authority areas, while for 23 less common cancers the focus is only down to the level of counties (or groups of counties).

For the small-scale series, each area is coloured to show whether it has a significantly higher (or lower) death rate than the national average for that cancer, and also whether it ranks in the top (or bottom) 10 per cent of all areas. For the less detailed, county maps, four colours indicate the relative excess by which the areas differ from the national average. The authors, of the



Ornate bee hive in Poland, carved from a log: the cavity is in the body of the man; the flight entrance is just above his right hand; and there is an access door at the back. Taken from Eva Crane's *The Archaeology of Beekeeping*, published by Duckworth at £25.00.

Medical Research Council's Environmental Epidemiology Unit in Southampton, drew the maps from the mortality data for the period 1968-78 routinely collected by the Office of Population Censuses and Surveys. Some of the features in the maps have long been known, though seldom displayed so vividly, such as the high mortality from stomach cancer in North Wales and Northern England, and from cancer as a whole, and from lung cancer in particular, in London. In fact, there is hardly a map in which something does not catch the eye. But before elaborate theories are constructed to attempt to explain why, for instance, two widely separated counties should show a raised mortality from a particular cancer in one sex and other counties equally far apart should show an excess in the other, it is important to realize the limitations of the data on which this atlas is based.

The fact is that differences in local cancer death rates may simply reflect the throw of chance. Other variations may be due to nothing more than

differences in death certification practices. The authors are careful to point out that the data relate to area of residence at death, which is of course not necessarily where the cancer-causing agent first acted. Therefore, retirement areas or even the presence of a terminal care hospital for cancer patients may produce a distorted impression. One doctor certifying the death of a woman from pneumonia secondary to breast cancer may indicate the cancer as the underlying cause, whereas another doctor will not. Such differences are particularly likely in the older age groups when cancer is most frequent and pathology often multiple. Indeed, to reduce this possibly important source of "noise", it would have been more valuable if the oldest age groups had been excluded from the atlas.

Other certification practices may result in biases. Thus, area differences in mortality from cancer of the brain (mapped) may reflect differences in describing such cancers as cerebral tumours (unmapped). Similarly, maps

Leisure patterns

Recreation and Resources: leisure patterns and leisure places
by Allan J. Patmore
Blackwell, £22.50
ISBN 0 631 11551 X

Professor Patmore is the author of an earlier, much acclaimed, pioneer work on the geography of recreation, *Land and Leisure in England and Wales* (Penguin, 1972), and in this new book he provides a no less confident and comprehensive review of current issues relating to the recreational use of urban and countryside resources. His book deserves to be standard text for the new generation of undergraduates participating in the rapidly growing number of courses devoted to the study of leisure and recreation.

The book is written from the specific viewpoint of the geographer. However, the commitment to the approach of the spatial analysis does not blind the author to the need to see any study of leisure/recreation in its social context. It is therefore reassuring that the book commences with a chapter labelled "leisure and society" which briefly examines the relationship between work and leisure, the meaning of, and the administrative and institutional framework for, leisure, effectively roots the book

within the changing social structure of the United Kingdom in the late twentieth century. The author then sets wide bounds to his primary theme - spatial patterns of leisure activities and the use of land and water resources for recreation. The whole gamut of urban and countryside recreation is examined, although the former gets much more cursory treatment than the latter. Important and complex issues discussed include the social context of leisure, the historical development of recreational resource use, the analysis and measurements of demand and the constraints upon it, urban recreation hierarchies, planning standards and planning approaches, patterns of rural recreation, countryside evaluation and conflicts, carrying capacity, and so on.

The effect of this eclecticism inevitably produces a somewhat superficial approach in what is otherwise a very sound collation of existing material, a problem that is not helped by the fact that in a book of only 244 pages there are 140 tables, figures and other illustrations. However, Professor Patmore makes good use of material, and his prose is never less than elegant and lucid.

Although this synoptic approach is extremely valuable in collating and presenting such a range of disparate material, its limitations do become apparent, especially in a final chapter on "prospect and practice", essentially a plea for a more rational approach to recreational provision through enhanced information, less

are shown for four separate types of leukaemia, but not for leukaemia of unspecified type, and it is possible that some of the differences shown in the maps reflect variations in the detail of certification. Nevertheless, the recently discovered connexion between the beechwood furniture industry near High Wycombe and nasal cancer shows up clearly in the relevant map. Similarly, maps also show a high incidence of mesothelioma in men in the dockyard and shipbuilding areas, confirming the known link with asbestos insulation used in ships in World War II. Such cases encourage one to believe that other concentrations shown in the atlas may also be significant.

The atlas is likely to be consulted by lay as well as medical people. For the reader interested in whether his own locality has a high mortality from a particular cancer, the atlas will be helpful if the cancer in question is covered by the detailed maps, but if it is only recorded by county he is likely to be tantalized, for county boroughs are merged with their associated counties (and because of their size may then dominate the picture), and other counties are not shown separately. Wales suffers in this respect and is divided into only two parts, although this is perhaps offset by the fact that Wales has unusually low rates for cancer as a whole.

The authors do not exaggerate the value of the atlas as a source of clues to unsuspected causes of cancer; indeed, it is difficult to think of a single example of a discovery of a cause of cancer which started from a published cancer map. In the introduction they point rather to the value of the atlas as "a helpful way of displaying the available data to enable... areas with similar rates or gradients of rates across the country to be visually apparent"; and in this it undoubtedly succeeds. The atlas should also help in "the development of hypotheses about causal factors which are responsible for any [area] differences". It may well further encourage screening for cancer of the cervix in areas shown to have a high mortality. It will certainly heighten interest in the search for clues to the causes of human cancer.

L. J. Kinfen

L. J. Kinfen is director of the Cancer Research Campaign's cancer epidemiology research group in the department of community medicine, University of Oxford, Radcliffe Infirmary, Oxford.

A report on acid rain for the Commission of the European Communities Directorate-General for Environment, Consumer Protection and Nuclear Safety by Environmental Resources Limited has been published as *Acid Rain: a review of the phenomenon in the EEC and Europe* by Graham & Trotman at £12.50.

haphazard systems of provision, improved access, and continuing conservation of scarce resources. Though worthy objectives, the author's arguments are flawed by his failure to address the fundamental issue in leisure policy - the need to take account of the changing structural relationships between work and leisure. Here the dilemma of "enforced leisure" through growing unemployment and the increasing polarization of the geography of deprivation, present decision-makers with problems they have scarcely begun to confront, never mind solve.

In this respect, the book is also ill-served by the limits of its geographical area - England and Wales. Professor Patmore rightly asserts that the understanding of patterns of recreational activity and resource use have no mere academic interest, as he observes, "the lessons of precept for practice are vital if all the resources of the economic, social, and physical environment are to be effectively harnessed for the fullness of human satisfaction." Experiences from other developed countries, in particular, might have helped him illustrate and assess the available policy options in pursuit of this commendable goal.

Brian Duffield

Brian Duffield, formerly director of the Tourism and Recreation Research Unit at the University of Edinburgh, is Vice-Principal of Dunfermline College of Physical Education, Edinburgh.

Colleges of Art

London Borough of Bromley RAVENSBOROUGH COLLEGE OF ART AND DESIGN PRINCIPAL LECTURER (COURSE LEADER)

History of Art and Related Studies Department
Salary on scale £13,164 to £18,389
Including London Weighting

Applications are invited from Design Historians to lead and continue development of this area of study as the College develops towards an institution solely concerned with Foundation Studies, Design disciplines and Television/Broadcasting Technology.

Further details and application forms from The Registrar, Ravensbourne College of Art and Design, Walden Road, Chislehurst, Kent. Tel. 01-488 7071. Closing date: 3rd February, 1984.

(14059)

South Glamorgan County Council WELSH COLLEGE OF MUSIC AND DRAMA Colog Cerdd a Drama Cymru

Applications are invited for the important post of:

PRINCIPAL

which will be vacant from 1st September, 1984.

This national College provides for the study of instrumental and vocal music, composition, theoretical subjects, and all aspects of dramatic art, providing courses both in Welsh and English. It occupies an impressive new building in Cardiff Castle grounds, adjacent to the Civic Centre. The vacancy arises from the retirement of the present Principal, Dr Raymond Edwards.

The Governors are seeking a person who will make a distinctive contribution to the further development of the College. Salary in accordance with Burnham (Further Education) Report Group 4. Application forms and further details may be obtained from: The Director of Education (Ref: W01D 1), County Offices, Kingsway, Cardiff CF1 4UG, to whom applications should be returned by Friday, 17th February, 1984.

(14062)

Rochdale College of Art St. Mary's Gate Rochdale OL12 6RY Tel: 40421

Principal: Daniel Gleeson

Applications are invited for the following additional posts in this growing College:

Lecturer in Textile Design. Course and to liaise with students on Portman Arts Diploma Course.

Professional performer with good teaching experience in drama and film.

Lecturer in Specialist for Video/Film, Animation and Photography.

Lecturer in Specialist for Printmaking & Drawing.

Lecturer in Specialist for Fashion.

Lecturer in Specialist for Textiles/Surface Print.

For further details and forms of application please contact the Principal's Secretary.

Closing date 1st February 1984.

Research

National Children's Bureau

RESEARCH ASSISTANT

The work will involve preparing and reviewing research reports, liaising with researchers, and maintaining the Bureau's research database.

Applicants should have a degree in a relevant subject, preferably in social sciences, and be able to write clearly and concisely.

The post is full time for approximately two years.

Salary: £12,445 to £17,745 (depending on experience).

Applications should be sent to: The Director of Research, National Children's Bureau, 100 Victoria Road, London W1A 1AA.

Sunderland Polytechnic Department of Civil Engineering RESEARCH ASSISTANT

Salary: Scale: £4,947-£6,551

Applications are invited from graduates with a degree in Civil Engineering or Mechanical Engineering to participate in a research programme in the use of novel filters in cement products.

The post is available immediately and the successful candidate will be expected to register for a CENAA M. Phil degree.

A written application in the form of a Curriculum Vitae should be submitted to the Personnel Officer, Sunderland Polytechnic, Tower, Ryhope Road, Sunderland, SR2 7EE.

Closing date: 3 February 1984

University of Bath

RESEARCH OFFICER

Applications are invited for a full time post to work on an ERFC project with the development of a fully variable geometry turbocharger, with particular reference to the suppression of compressor surge.

Applicants should have a good knowledge of fluid dynamics, thermodynamics, and experience in the use of computers.

Starting salary up to £7,630 per annum, according to qualifications and experience.

Application forms from the Personnel Officer, University of Bath, Bath BA2 9AY, quoting ref. no. 84/14. Closing date: 7.2.84

(14061)

Administration

The University of Leeds Office of The Bursar TWO POSTS OF ADMINISTRATIVE ASSISTANT

Applications are invited from graduates for people with experience in financial administration and who are able to provide a high standard of service.

a) Candidates for one post should have previous administrative experience in financial administration and will be expected to make a significant contribution from an administrative background.

b) The second post will be ideal for a younger candidate wishing to pursue a career in financial administration and an opportunity to gain experience in the field.

For further details and application forms, please contact the Bursar, University of Leeds, Leeds LS2 9JT.

Closing date: 1st February 1984.

Further particulars may be obtained from the Registrar, The University of Leeds, Leeds LS2 9JT.

Applications should be sent to: The Registrar, The University of Leeds, Leeds LS2 9JT.

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Closing date: 1st February 1984.

STUDENTSHIPS awarded by the GERMAN HISTORICAL INSTITUTE LONDON

The German Historical Institute will award a number of studentships to enable British postgraduate students to pursue research in Germany.

Applicants must have completed at least one year of postgraduate study in a relevant subject and be able to speak German.

The studentships are for a period of 12 months, starting in October 1984.

Other appointments or scholarships cannot be held during the tenure of the studentship.

The amount of the studentship is £3,000 per annum, plus a stipend of £1,000 per annum.

Applications should be sent to: The German Historical Institute, 100 Victoria Road, London W1A 1AA.

Closing date: 1st February 1984.

Further particulars may be obtained from the Registrar, The University of Leeds, Leeds LS2 9JT.

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University of Aston Birmingham ADMINISTRATIVE ASSISTANT

There is now an opportunity for an Administrative Assistant to join the section of the Registry which is concerned with academic planning.

The successful applicant will be responsible for the accurate recording and analysis of information covering all the University's diverse range of activities.

This post, which is for immediate appointment, calls for someone with a good knowledge of the University's administrative structure and procedures.

The appointment is for one year's duration in the Administrative Grade 18 salary (£6,310 to £9,875).

Application forms and further details are available from: Mr A. G. Green, The University of Aston, Birmingham B4 7ET.

Closing date: 3rd February 1984.

Further particulars may be obtained from the Registrar, The University of Leeds, Leeds LS2 9JT.

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Colleges and Institutes of Technology

North East Surrey College of Technology Surrey Education Committee Reigate Road, Ewell, Surrey KT17 3DS

Applications are invited from men and women for the following post to be filled with effect from 1 May or 1 September 1984.

LECTURER IN LAW

Applicants must have a law degree and be qualified to teach law at the University level. Some experience in legal education is desirable.

Salary: £12,445 to £17,745 (depending on experience).

Application forms and further details are available from: The Registrar, North East Surrey College of Technology, Reigate Road, Ewell, Surrey KT17 3DS.

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